MODEL AIRPLANE NEWS

JUNE 1943
TWENTY CENTS

SPITFIRE IX PURSUIT
(See page 28)

EXPLANATION TO MODEL BUILDERS:

Why - temporarily - we are shipping

UNDECORATED TUBES

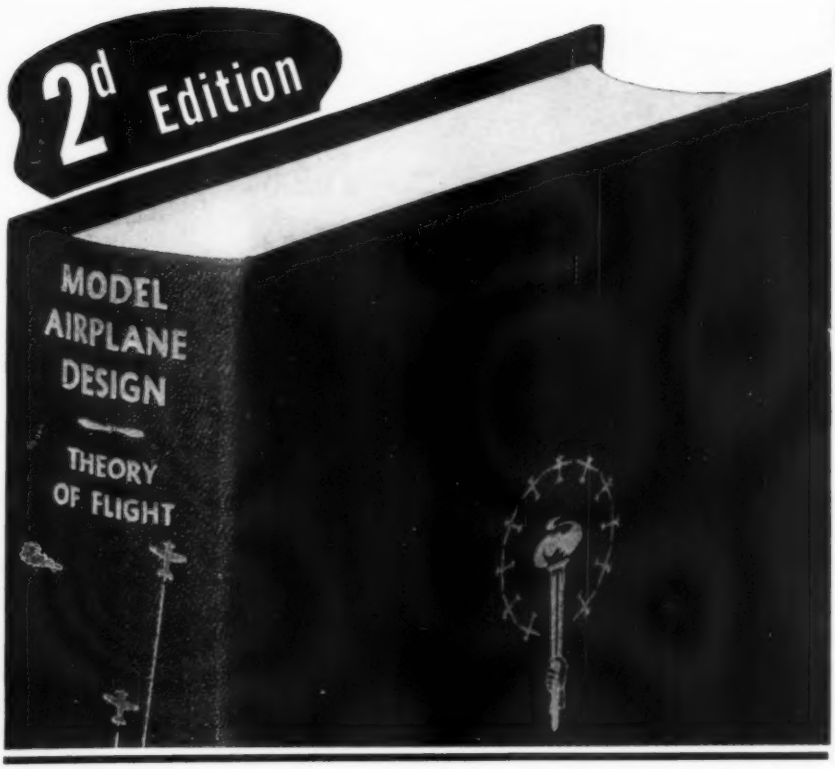
to speed deliveries on orders for

TESTORS **5¢ MODEL AIRPLANE CEMENT**

LOOK FOR THE NAME...
TESTOR'S ON THE SHOULDER OF EVERY TUBE!

Very frankly, we are literally "snowed under" by a record-breaking volume of orders for Testor's Model Airplane Cement! Bottleneck of production has been the process of decorating the tubes . . . lithographing them in their brilliant red, yellow, and blue design. Therefore: to speed production and to speed deliveries . . . we have decided to ship *undecorated* tubes to dealers until our backlog of orders is substantially reduced. You can buy these plain tubes with perfect confidence. *Just remember to look for the name TESTOR'S on the shoulder as illustrated above.* It's your positive guarantee of the identical cement you have always found in the familiar Testor package!

TESTOR CHEMICAL COMPANY, ROCKFORD, ILLINOIS, U.S.A.



WHAT OTHERS SAY OF THIS GREAT BOOK—

"I am an instructor here in the twin-engine advanced flying school and have four very eager and apt cadets who are getting closer to their Army wings every day. It is my sincere belief that Mr. Grant's book will help instill in them a deeper 'know-how' about flying. I am an old model builder myself and find the book clears up many a knotty problem I've faced in designing my ships. Keep up your fine work!"—*From an Army Air Force Instructor.*

"Your book certainly is a big help! I never knew I knew so little. I am using the Grant X section, a completely circular crossection for the fuselage, and a two wheel retractable gear which is simple in design. Force arrangement is in strict accordance with your formulas as stated in your 'bible'."—*F.G.*

"I have seen your book and think it excellent. Please rush my copy as soon as possible as I am to start training in the Air Corps quite soon as an Eng. Cadet."—*J.C.B.*

"It's a splendid piece of work, the best ever written on model theory and construction . . . thoroughly sound and practical . . . and will be welcomed with joy by everyone interested in the art."—*From Alexander Klemin, Daniel Guggenheim School of Aeronautics, N.Y. Univ.*

"I regard Mr. Grant as THE AUTHORITY."—*J.F.P.*

"Already in use as a text book in airplane design classes in high schools, this book should find its biggest reception in many of the pre-flight aeronautics classes being organized in schools throughout America."—*National Aeronautics.*

"It's about time a book of that kind was published as it gives the modeler a 'treasure-house' of practical instructions and information; I know it will help me immensely, as well as the other members of our club."—*F.B.*

"The author has established basic scientific principles for model airplane design, so that, instead of stumbling blindly through many attempts at correct proportions, the model builder need only apply the author's simple fundamental laws, presented in this book for the first time. It is, in fact, a complete exposition of the aerodynamics and design of flying models, with formulas and graphs, and the author is commended for his thoroughness."—*Aero Digest.*

"It is one of the most important works on the subject which has yet appeared. . . This book is most attractively produced and should certainly be purchased by all those interested in the scientific construction of model aeroplanes."—*Practical Mechanics (England).*

"I believe that this information which you so clearly present will be invaluable to all model builders both advanced and beginners."—*T.T.H.*

SINCE the first edition of this outstanding aeronautic book was published, we have been telling you in these advertisements—

..That "Model Airplane Design and Theory of Flight" has become a vital force in preparing young America for the new Air Age!

..That **MAJOR AL WILLIAMS** says of this important work: ". . . And now this greatly needed book appears, with all its important data, practical instructions, and a general wealth of information which to my knowledge has never before been assembled in any comparable manner. I know it will richly serve through the years in guiding and training the air-minded youth of our country."

..That this book is a **BASIC TRAINER FOR AN AVIATION CAREER**—and a **COMPLETE INSTRUCTOR ON MODEL FLYING** . . . It presents a thorough training in the basic rules governing **ALL** flight . . . It enables the **BEGINNER** or **ADVANCED** student to design his plane scientifically . . . It eliminates the "cut and try" method by introducing a plan of design based on simple rules which **ANYONE** can apply to achieve the goal of perfect flight! . . .

Now we want **OTHERS** to tell you about this significant work!

We have received many enthusiastic letters from among the thousands of students, men in our armed forces and our aviation industrial plants, schools, libraries, and modelers everywhere, who have bought copies of "Model Airplane Design and Theory of Flight" and are using it as an indispensable handbook and reference volume . . . Because we believe their endorsement is stronger than any new advertisement we can formulate, we are reprinting on this page excerpts from some of these letters.

The Author
CHARLES H. GRANT
—Princeton Eng. School; Massachusetts Inst. of Tech.; member of "Early Birds"; for over 20 years the world's foremost model flying authority; for past twelve years Editor of MODEL AIRPLANE NEWS.

528 PAGES 205 DIAGRAMS and PLANS • $3.75 Per Copy

ORDER YOUR COPY NOW

MODEL AIRPLANE NEWS 63
551 Fifth Avenue, New York, N. Y.

Please send me postpaid a *new edition* copy of C. H. Grant's book "MODEL AIRPLANE DESIGN and THEORY OF FLIGHT," for which I enclose $3.75. (Foreign $4.50, except Canada $4.00)

Name .....

Address .....

City..... State.....

A CONSOLIDATED Liberator bomber recently flew from the United States to India, a distance of 11,748 miles in 67 hours, 35 minutes, according to a recent War Department dispatch establishing "a new record for delivery of aircraft over such a distance." The report did not state whether or not the flight was made non-stop and if it was it would break, by a considerable margin the present world's record for distance in a straight line of 7,162 miles set by two Vicker's Wellesley monoplanes November 5-7, 1938. It appears likely that at least one, if not two, stops had been made for, although a large supply of fuel might be carried in the bomb-bays and the cabin of the airplane, it seems unlikely that the 13,500 gallons required for such a trip could be carried by a single airplane. (The Brobdingnagian Douglas B-19 is only capable of carrying 11,000 gallons.) The flight, however, is a notable one and an index to the capabilities of modern bombers.

The famous Flying Fortress "Southern Comfort," which gained fame battling its way back safely to its English field after enemy fighters had spattered it, a shell had knocked a hole big enough for a man to walk through in the rudder and the power-plants were shot up by flak, has come to an end in a very similar manner. Returning from a successful raid on Rotterdam, the Fort was jumped by Focke-Wulf enemy fighters and an oil line damaged which burst into flames. The crew stayed with the ship until over British soil, then Lieut. Hugh Ashcraft of Charlotte, N.C. gave the order to jump. All leapt overboard and the wing panel was all but burned off by the time Ashcraft left the ship. All escaped safely except the top gunner who stripped off his chute a hundred feet in the air expecting to land in water. One gunner, James Patterson of Boise City, Okla. was changing from an unsatisfactory 'chute to a good one as he left the ship! Without the leg straps clamped, he held on to the shoulder straps and landed safely, suffering only a wrenched shoulder when the 'chute opened.

Dr. Jose B. R. Dantas, president of the Brazilian airline, Cruziero do Sul (formerly the German-controlled Condor airline) has received permission from the Army and Navy to purchase four Douglas DC-3 airliners, the first such airplanes purchased by anyone other than the Army or Navy in two years. According to F. L. Duncan, of the Defense Supplies Corporation, 50 American technicians will accompany the planes to Brazil and assist in the operation over the 7,000 miles of airline routes. The airline is operated with private capital and "nationalization" of Latin-American airlines means only that control has returned to native investors.

Maj. Gen. Levin H. Campbell, Army Chief of Ordnance, recently announced that during the first World War it required an average of 17,000 rounds of anti-aircraft fire to hit an airplane (not bring it down). "On Guadalcanal," he announced, "statistics showed that firing with our 90 millimeter anti-aircraft guns at 27,300 feet elevation, we averaged 50 rounds per airplane to bring it down!"

Maj. Gen. James H. Doolittle, of whom little need be said, has been awarded the Air Medal by the War Department, for engaging in five separate bombing actions against the enemy in North Africa. A real flying and *fighting* air general!

Col. Robert L. Scott, Jr., commanding officer of the 23rd Fighter Group (formerly the Flying Tigers in China), has returned to the U. S. to instruct advanced combat school training, it has been announced. Having shot down 13 confirmed victories and having 22 probables to his credit, Scott is the holder of three D.F.C.'s, two Silver Stars and two Air Medals. Now 34 years old, he is considered too "old" to fight, thus his transfer. "The Japanese pilot is damn good, and don't let anybody fool you about his so-called 'suicidal fanaticism,'" Scott reports. "His daring seems to be prompted by his fear of returning home with nothing to his credit. He is human and doesn't want to get killed any more than anyone else."

The truth is now out on one of the war's most closely guarded secrets, with the recent revelation of the "secret weapon" being used by the British in Africa against Rommel. Nearly a year ago, a squadron of Hawker Hurricane fighters armed with two 40 millimeter cannons was sent into action against Rommel in the desert when General Montgomery began his grand march across Africa in pursuit of the German Field-marshal. The cannon, mounted in either wing, were installed at a downward angle of some 5° to enable pilots to race along above Rommel's supply trains and shoot downwards while flying level. Actual target was the Afrika Korps' tanks, which they smashed one after another. Several other squadrons were soon in action and now a considerable number of these planes are in action north of the Mareth Line recently penetrated by Montgomery's forces. Undoubtedly this will help to clear up the mysterious manner in which the British Eighth Army manages to break through after Rommel, regardless of opposition, while other forces are frequently repulsed.

According to Lt. Gen. William S. Knudsen, director of production for the War Department, the U. S. will produce a total of 90,000 airplanes in 1943 and he knows this is true because he has seen *all* the aircraft factories in production and with his famed mechanical eye is capable of judging. Such an air fleet, even in this day of air fleets, staggers the imagination!

Brig. Gen. David Grant, Air Surgeon of the Army Air Forces, states that soon helicopters will be in use in the front lines to

(Continued on page 62)

14TH YEAR OF PUBLICATION

MODEL AIRPLANE NEWS

JUNE, 1943 Vol. XXVIII, No. 6

CONTENTS

FEATURE
The Great Yankee "Doodle".. 6

RUBBER POWER
Flying Models Under Water..17
Building the Vultee Valiant...24

GAS POWER
"Vee" for Victory.....12

GLIDER
Class "B.H.L." Glider..... 9

THREE VIEWS
Super Spitfire.....22
Lockheed Ventura 30

SCIENCE
Modeling Your Future in Aviation 10
Aviation Forum.....31

PLANE ON THE COVER
Super Spitfire.....23

NEWS
Flash News 2
Skywriter's Library.....16
Frontiers 18
Air Ways.....20
Sky Scouts.....29
Flight Paths of Our Army Air Aces.....31

Edited by
Charles Hampson Grant

AN AIR AGE INC. PUBLICATION

Published monthly by Air Age, Inc., Mount Morris, Illinois. Editorial and advertising offices: 551 Fifth Ave., New York, N. Y. George C. Johnson, President; Jay P. Cleveland, Advertising Manager. Entered as second class matter Dec. 6, 1934 at the post office at Mount Morris, Ill., under the act of March 3, 1879. Additional entry at New York, N. Y. Price 20c per copy. Subscriptions $2 per year in the United States and possessions; also Canada, Cuba, Mexico, Panama and South America. All other countries $2.50 per year. *Copyright 1943 by Air Age, Inc.*

"Modelbuilding Cadet has a 25% Advantage over the other fellow"

★ ★ ★

Writes R. T. C. of the RAF, Dewinton, Alberta, Canada

Read what he says: "It has been my experience that a model building cadet has a 25% advantage over the other fellow in ground and flying instruction; model building and flying and the competitions involved develop a keenness which is a most desirable quality for an air-crew member. The construction of a model so impresses the aircraft's details upon one's mind that instantly the aircraft is seen in the air, it is recognized. It's the split-second advantage the model builder has over his fellow that can be the difference between a ripe old age and curtains. I should like to congratulate you upon the quality and authenticity of your kits which I used to purchase before the war, at home in England. The finished models were so good that I hadn't the heart to risk damaging them in flying. Long may you market such kits. If my customary luck deserts me and my letter is published I should like the chance to build a model of the Douglas Dauntless."

America's First Line of Models

★ ★ ★

★

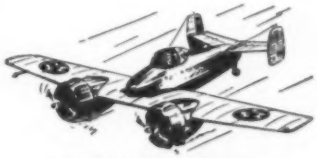
World's Hardest-Hitting Dive Bomber

DOUGLAS SBD "DAUNTLESS"

Has a speed of around 300 m.p.h. carrying a 500 lb. bomb beneath fuselage. Delivering heavy damage against the enemy. Span 30⅝". C-D Master Kit SF-89..... **$3.50**

Grumman F4F "WILDCAT"

An excellent U.S. Navy Shipboard and Marine fighter. Lives up to its name—in the case, for instance, where one of our men downed 5 Jap bombers in 5 minutes. Very maneuverable. Has a speed of 325 m.p.h. Model Span is 26¼". C-D Master Kit SF-83..... **$3.00**

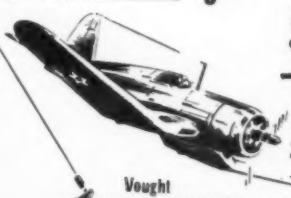


GRUMMAN "SKYROCKET"

Navy's "Terror of the Skies." Reputed 450 m.p.h. speed. Span 31½". C-D Master Kit SF-75..... **$3.50**

British "SPITFIRE"

Pride of the RAF. Fast, maneuverable and deadly interceptor-fighter. Span 27⅝". C-D Master Kit SF-73..... **$3.00**



Vought Sikorsky "CORSAIR"

A Navy fighter in the 300 m. p. h. class. Span 30 3/16". C-D Master Kit SF-79.. **$3.50**

North American "MUSTANG" (P-51)

A tough vicious fighter that is very much in today's news. 350 m.p.h. Span, 27 3/16". C-D Master Kit SF-91..... **$3.00**

Hawker "HURRICANE"

Build the famous "Hero" plane of the "Battle of Britain." Span 30". C-D Master Kit SF-78..... **$3.00**

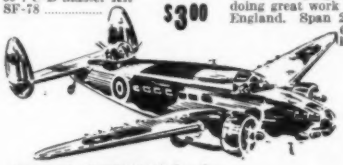
BELL P-39 "AIRACOBRA"

The Swift flying "cannon-plane" that's doing great work in the Solomons and England. Span 25⅜" C-D Master Kit SF-76..... **$3.00**

(at right)

Lockheed P-38 "LIGHTNING"

"Fastest thing on wings," says the Army. A perfect interceptor for bombers because of its high ceiling and terrific diving power. Span 38¾". C-D Master Kit SF-85..... **$4.00**



Lockheed "HUDSON" Bomber

Used with terrific effect on the Japs in the Solomons. Used for bombing, fighting and reconnaissance. Called "Old Boomerang" by British, for it usually comes back. One of the most popular models in the whole C-D line. Big 49¾" span. C-D Master Kit SF-95..... **$7.50**

Brewster "BUFFALO"

Highly maneuverable and fast. Climbs 4,000 ft. per minute. Speeds around 350 m.p.h. Has exceptional cruising range. Also used by British and Dutch. Former nicknamed it "Peanut Special." Span 26¼". C-D Master Kit SF-87..... **$3.00**

★ ★ ★

Republic P-47 "THUNDERBOLT"

The "Flying Battleship" with tremendous fire power. A speed of over 425 m.p.h. and a 40,000 foot ceiling. One of our greatest fighters. Span is 36¾". C-D Master Kit SF-81..... **$4.00**

Big 3 Ft. Flying War Models

All super values! Kit T74 — Messerschmitt ME-109. Kit T76—

"Airacobra"; Kit T77—
"Warhawk"; Kit T78—
"Hurricane"; Kit T85—
"Lightning"; Kit T91—
Mustang.

Each only **$1.50**

NAZI JU-87B STUKA

The dive bomber used so widely by the Nazi Germans all over Europe, at Crete and now in Africa. Span 36¾". C-D Master Kit SF-84..... **$3.50**

Curtis P-40 "TOMAHAWK"

Making history everywhere it takes to the air. Span 28¼". Camouflage instructions included. C-D Master Kit SF-77..... **$3.00**

Send for New #40 Catalog

Features C-D War Models in thrilling action "shots" in various fighting fronts. Many others. No catalog ever before like it. Send 5c for your copy—none free.

New, Redesigned Super CONDOR SOARER

Big 7 ft. Span. More graceful lines, simpler construction. Soars for hours. Easier than ever to build. Kit VE-5019, only..... **$1.00**

Biggest $1.00 Plane in U.S.

4-Ft. EAGLET

Longer lasting. Beautiful flights. Patterned after "Baby Bowlus." Easily built. Kit VE-5018, only..... **50c**

MESSERSCHMITT ME-109

Germany's mass production fighter. In action wherever Nazis are fighting. Span 21½". C-D Master Kit SF-74..... **$3.00**

Ordering Instructions

See your dealer first. If he can't supply you, send check or m.o. (cash at own risk). No C.O.D.'s. Postal restrictions now prohibit shipments outside U.S. except to Canada and Mexico (to which 10¢% must be added). For service men still stationed in U.S.: restrictions prohibit our shipping to A.P.O. or Fleet P.O. box numbers—so, use a local nearby address only! Special Delivery 25c extra (U.S. only). Ohio residents add 3% sales tax. All Kit contents and prices subject to change or cancellation without notice. On orders less than $1.00, add 15c postage.

Cleveland Model & Supply Co., 4508C60 Lorain Ave., Cleveland, O.

World's Largest Makers of Quality Model Aircraft Since 1919

CLEVELAND MODELS

"THE MODELS THE MEN IN THE AIR FORCES BUILD"

THE DRAFT AND YOU

We are in a hard war . . . IF YOU ARE 16 or 17 . . . you have the opportunity of a lifetime. Help your country to VICTORY and at the same time TRAIN yourself for a CAREER in Aviation. See Curtiss-Wright Technical Institute ad on page 3—MAIL COUPON TODAY and include your birth date, for vital information.

SUPER-CYCLONE OWNERS

As previously announced, the manufacture of the SUPER-CYCLONE was suspended in April, 1942, for the duration of the war. We have no more engines for sale. The resources of this Company and affiliated Companies are devoted to the winning of our peace. When this is achieved, our engineers will again develop the same high-quality engines we have manufactured in years past.

While, during this period of suspended manufacture, we cannot render to you engine-owners our customary engine repair service we still have many of the replacement items in stock. Send for your copy of our up-to-date Parts List and keep your present Cyclone in service.

AIRCRAFT INDUSTRIES CO.

Grand Central Air Terminal, Glendale, California

HOME OF THE FAMOUS

CURTISS-WRIGHT TECHNICAL INSTITUTE

EVERY TRAINED MAN . . . *Counts*

Whether he be in the Aviation Industry or in the Armed Forces. EVERY TRAINED MAN COUNTS. Conscription now includes all men 18 years old and over. Enlistments are closed.

Now men will be assigned to our war effort according to their qualifications. So the best way to get into your preferred branch of service is to be qualified for it. If Aviation is your choice your best chance NOW is to TRAIN for it. MAKE YOURSELF THE KIND OF MAN THE AVIATION INDUSTRY OR THE AIR FORCES WANT: THE KIND THEY CANNOT DO WITHOUT. If you are thoroughly trained you will be advanced rapidly in either case.

CURTISS-WRIGHT TECHNICAL INSTITUTE IS THE ANSWER . . . located in the very center of Southern California's giant aircraft industry. Contractors to the Army Air Forces, it has for years been training civilians thoroughly in Aeronautical Engineering and Master Mechanics. These men will be and have been definitely qualified for their place in aviation, either military or civil.

Established in 1929, Curtiss-Wright Tech is one of the oldest, best known, largest and most distinguished aeronautical schools in the nation. Its high standing in the aircraft industry is sharply indicated by the fact that Mr. Donald Douglas, President of the great Douglas Aircraft Company, chose this school for his own son's training.

The executives who have made aviation their career know that the value of each man is governed by two factors: his intelligent sincerity in selecting aviation as his life's work, and THE ABILITY AND EXPERIENCE OF THOSE WHO TRAIN HIM FOR THAT CAREER. They know that Curtiss-Wright Technical Institute graduates are and for many years have been thoroughly qualified to fill the exacting requirements of the aviation industry.

CURTISS-WRIGHT TECH offers you sound, practical and intensive training, which is designed primarily for a peacetime career, to do just one thing . . . TO MAKE MONEY FOR YOU . . . so upon graduation you can be independent and self-supporting for life. Because our war is largely a war of aviation it is doubly valuable today. It can prepare you direct for military service as a trained specialist and at the same time equip you for an after-the-war career in the industry of the future . . . AMERICAN AVIATION. Our thousands of successful graduates have proven, Curtiss-Wright Technical Institute training gets results and always pays. IT CAN DO THE SAME FOR YOU.

This school has never guaranteed positions for its graduates, but practically every graduate has obtained immediate employment and is advancing rapidly. The demand for our graduates far exceeds the supply, and we honestly believe every student who enrolls here will be able to obtain immediate employment upon graduation, or enjoy a position in the armed forces unavailable to the untrained man.

WARNING!—"Don't miss the boat." The greatest opportunity of your lifetime exists today! There never was such an opportunity in aviation for you; there may never be another. Make yourself more valuable to our war effort and insure for yourself an after-the-war major career and independence for life. DON'T FOLLOW—LEAD! Send in your enrollment before you "miss the boat."

If YOU Want the Air Force Show This Ad to Your Parents

Since 1939, long before the war, CURTISS-WRIGHT TECHNICAL INSTITUTE has been training Army Air Force mechanics under contract to our government. WE KNOW HOW!

Enlistments being closed, men are now assigned to the branch of service for which they are best qualified. If you want the AIR FORCE . . . TRAIN FOR IT WHILE THE OPPORTUNITY STILL EXISTS . . . before you become 18, if possible. Even if you were unable to complete your course, the training you received should be highly instrumental in enabling you to enter the service of your choice.

TIME IS OFTEN ALL TOO SHORT . . . IT WILL NOT WAIT. Your opportunity is here now. Make the most of it. SEND THE COUPON, including your age and birth date.

THIS TOWER OVERLOOKS AVIATION'S MOST DISTINGUISHED SCHOOL OF AERONAUTICS

Offering specialized and proven training in AERONAUTICAL ENGINEERING & MASTER MECHANICS

NO FLYING INVOLVED

CURTISS WRIGHT TECHNICAL INSTITUTE

GRAND CENTRAL AIR TERMINAL, 1229 AIRWAY, GLENDALE (LOS ANGELES) CALIF.
UNDER PERSONAL SUPERVISION OF MAJOR C. C. MOSELEY, OWNER, SINCE ITS ESTABLISHMENT IN 1929

Contractor to the U. S. Army Air Corps

JOIN THE U. S. AIR FORCES

BE WISE—PROTECT YOUR FUTURE

MAIL TODAY • DON'T DELAY

WITHOUT COST OR OBLIGATION SEND ME FULL INFORMATION AND CATALOG ON THE COURSE CHECKED BELOW

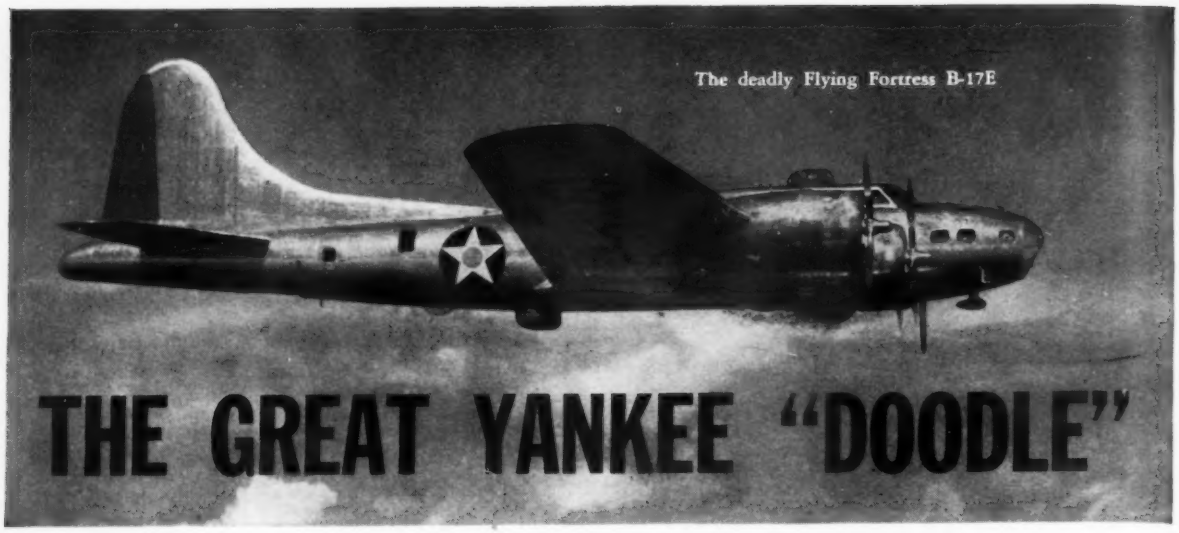
- ☐ AERONAUTICAL ENGINEERING COURSE
- ☐ MASTER AVIATION MECHANIC COURSE
- ☐ SPECIALIZED ENGINE COURSE
- ☐ SPECIALIZED AIRPLANE COURSE
- ☐ POST GRADUATE AERONAUTICAL ENGINEERING COURSE
- ☐ SPECIALIZED AIRCRAFT SHEET METAL COURSE
- ☐ AERONAUTICAL DRAFTING COURSE, HOME STUDY
- ☐ AIRCRAFT BLUE PRINT READING COURSE, HOME STUDY

NAME

ADDRESS

DATE OF BIRTH

CITY STATE MAN-6



The deadly Flying Fortress B-17E

THE GREAT YANKEE "DOODLE"

How do you design a brand new plane? Designers claim they don't actually know, but there's a clue to the answer in this story of how the Boeing Flying Fortress began

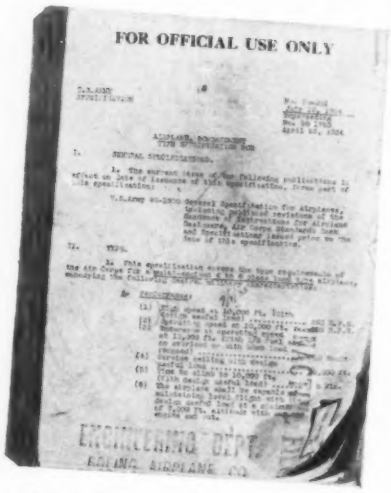
Reprinted through courtesy of "The Boeing News"

by ROLAND BRADLEY

IF YOU ever catch your pencil in the act of making marks that look like an airplane on a stray scrap of paper, it might be the hidden design engineer in you. There are people who think, and with reason, that the fine art of "doodling" reaches its highest point in the hands of the preliminary design engineer.

Not that dreaming up a plane is an aimless, meandering business. On the contrary, it is one of the most highly specialized jobs in the industry. It is only that any engineer and his pencil are inseparable and the design engineer, in particular, does a lot of his thinking out loud on paper in the early stages of creating a new plane. If his pencil seems to wander, if his thoughts appear to "doodle," you can bet it was just such thoughts that made the Boeing Flying Fortress the great Yankee doodle of the decade.

Actually, behind the design engineer's doodling is an amazing knowledge of airplane mathematics, a backlog of aviation experience and an inborn sense of what will and what won't fly well—and why.


FOR OFFICIAL USE ONLY

Original "type specification" from the Army, telling what the new multi-engine bomber must do

The design engineer also must be willing to play deaf and dumb about his work all his life. In times of war, he can't talk, and in times of peace, he won't. Try to get Don Euler to answer a leading question. He's a designer, chief of the new special development unit. Or try to ensnare Bob Jewett, who succeeded Euler as chief of the preliminary design unit. It's no go.

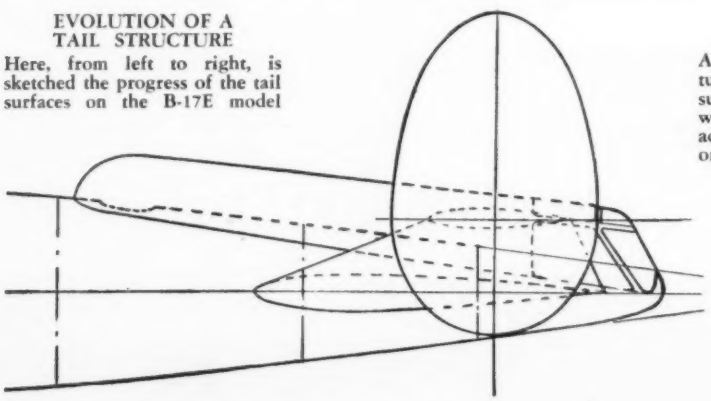
If you hark back far enough, they may occasionally break their habit of silence and talk about the past—how the Flying Fortress was designed, for instance. The basic details of that design are eight years old, now, so it's safe territory. Moreover, the way it was done is a good clue to the way the designer is working right now.

The first glimmerings of the great bomber rose from a huddle one August day in 1934, in the office of Claire L. Egtvedt, then general manager of the company. No design unit existed as such at that time, but there was design talent present: C. N. Monteith, chief engineer; R. J. Minshall, design engineer; E. G. Emery, project engineer, and his 24-year-old assistant, Ed Wells.

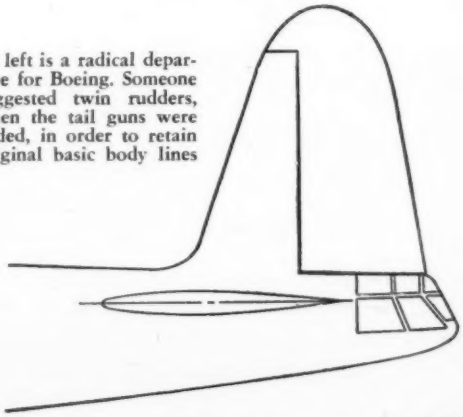
The reason for the confab lay on the

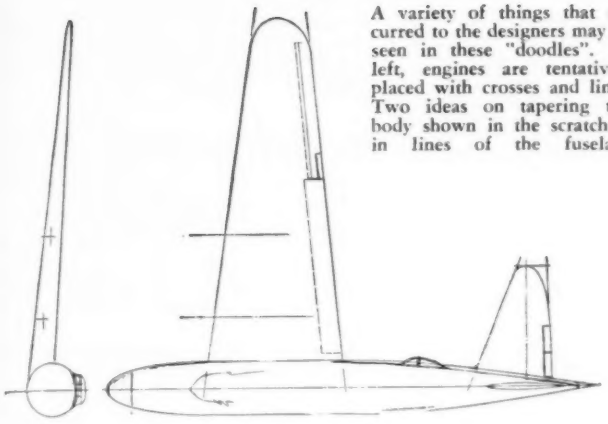
EVOLUTION OF A TAIL STRUCTURE

Here, from left to right, is sketched the progress of the tail surfaces on the B-17E model

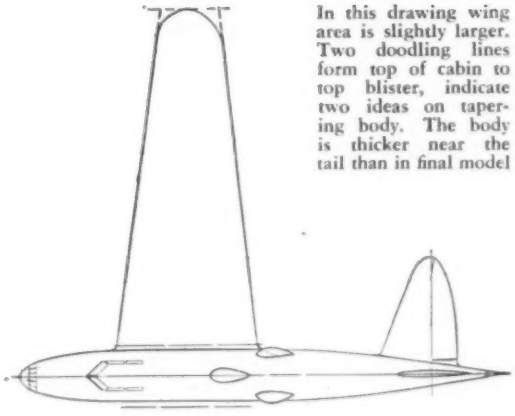


At left is a radical departure for Boeing. Someone suggested twin rudders, when the tail guns were added, in order to retain original basic body lines





A variety of things that occurred to the designers may be seen in these "doodles". At left, engines are tentatively placed with crosses and lines. Two ideas on tapering the body shown in the scratched-in lines of the fuselage



In this drawing wing area is slightly larger. Two doodling lines form top of cabin to top blister, indicate two ideas on tapering body. The body is thicker near the tail than in final model

desk. Boeing, along with several other aircraft manufacturers, had just received the Air Corps type specifications covering bombers to be submitted in the next bid competition for Army contracts. In an era mainly of open cockpit biplanes, what the Army wanted of this plane was phenomenal.

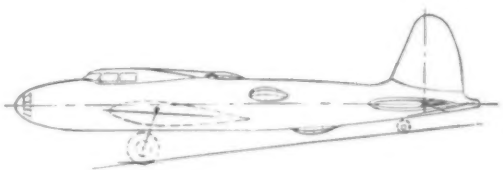
But Egtvedt said, "This looks like an invitation to build that 'dreadnaught' we've been thinking about."

The Boeing backlog of experience was plenty: the "Monomail" in 1930, the B-9 bomber in 1931, the "247" commercial transport in 1933—all pace-setting planes. Now, in 1934, it was likely Boeing men would continue to think in terms of pioneering they had done already, with low-wing, monoplane, stressed dural skin construction, retracting landing gear and power plants paired into nacelles ahead of the leading edge of the wing.

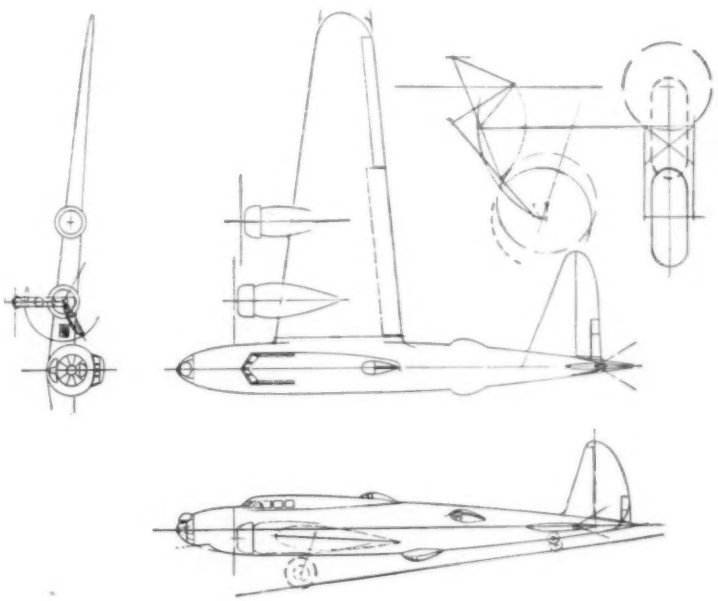
There was plenty of "know-how" present. Between the "know" and the "how" there would be reams of drawing paper. They went to work.

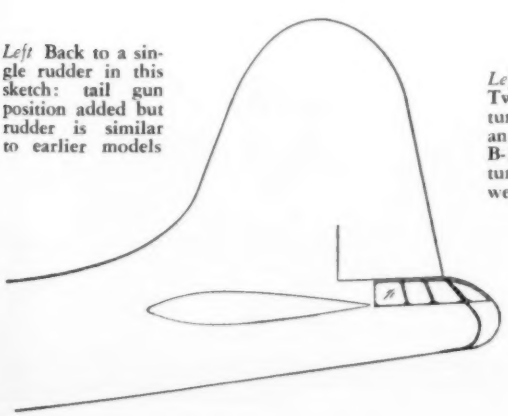
It is easy to design a plane that will go fast. It is no trick to design a plane that will carry a big load. It is (or was, then) something else to design a plane that will carry a big load and go fast, too. And that was the problem. Strange as it may seem in anything so scientific, engineering design resolves itself into an intricate series of compromises.

The Army wanted the new bomber to

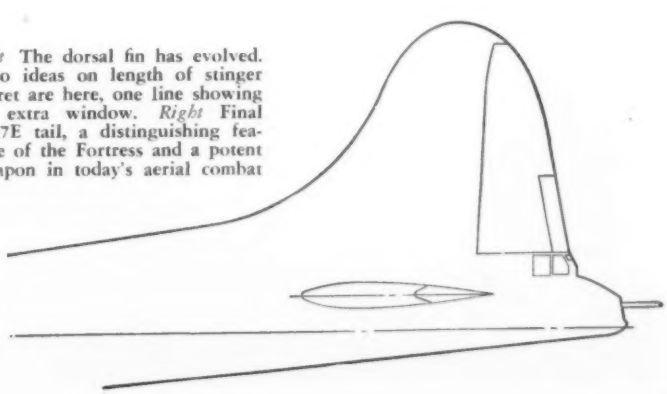


Below Here nacelles and gun blisters are in place but tail is still in doodling stage. Heaviest lines show influence of the "247" transport. Sighting station in nose is eliminated

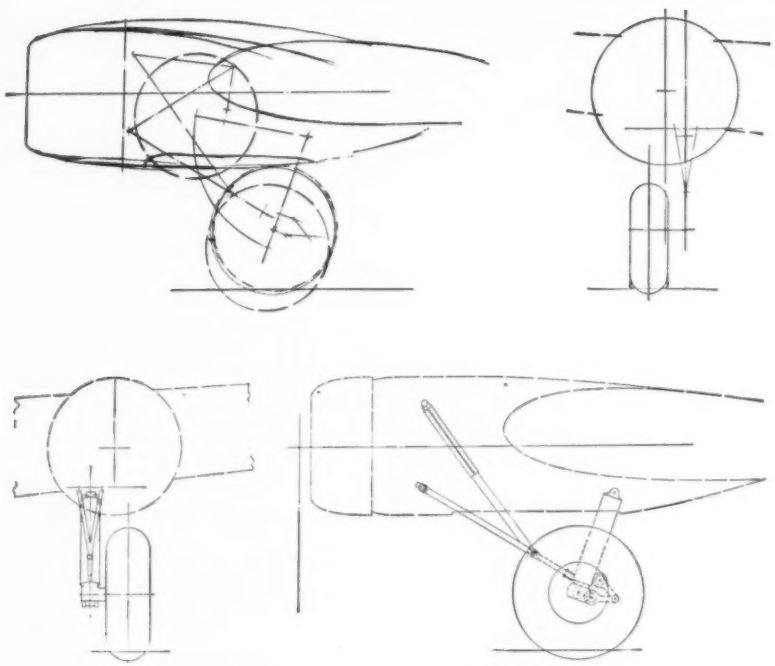




Left Back to a single rudder in this sketch: tail gun position added but rudder is similar to earlier models



Left The dorsal fin has evolved. Two ideas on length of stinger turret are here, one line showing an extra window. *Right* Final B-17E tail, a distinguishing feature of the Fortress and a potent weapon in today's aerial combat



At the left are original sketches made in developing the landing gear. The upper doodle establishes points and determines size of nacelle needed to house retracting wheels. Lower drawings show actual gear

possess a high speed of 250 miles an hour. Other factors being equal, the smaller the wing, the faster the plane. In the Fortress-to-be, the designers had to consider a wing small enough to permit that speed. But, the faster a plane in flight, the faster its landing speed, and the Army also wanted this plane to clear a 50-foot obstacle in landing, and stop within 2000 feet. A wing small enough to permit 250 miles an hour might also cause the plane to land so fast it would require a 4000-foot runway. So the designers had to compromise on a wing large enough so the plane *could* stop within the specified 2000 feet.

But—the larger the wing, the more the "drag" or air resistance in flight. This cuts down speed. In this case, with the engines then available, it might be to less than the 250 miles an hour required. So the designers had to work out a wing size that would retain the landing speed and *at the same time* permit the top speed specified.

So it went, with compromises on the compromises. Actually, many of them never got to the drawing board at all. Such things are juggled around in the designer's head and the bad ones mentally thrown out. Usually he's juggling two or three dozen compromises at the same time, working on them all simultaneously. There is no set order in which they are developed. Airplane designing is like the old riddle, "Which came first, the hen or the egg?"

As the team of Yankee doodlers juggled the facts and the figures of the "type spec," one of the first thoughts probably concerned available engines. The Army's circular called for a "multi-engine" bomber, which up to that time had been regarded as meaning two engines. The Boeing group reasoned that even if they had the biggest and best, two engines would never do to power the type of super-ship they visualized. Mentally they chose four, each capable of 750 horsepower, big for that day. Not only would they make possible the desired power, but four engines would provide an extra safety factor for long range operations.

By experience, they knew approximately how much weight each horsepower could lift off the ground and carry at the required speed. In this case, they figured it would be around ten pounds per horse. So, by multiplying the total horsepower, 3000, by 10, the number of pounds each horse must carry, they concluded that with the four engines they *were* thinking about they *could* have a *plane* weighing around 30,000 pounds.

Now, theoretically, each square foot of wing is assigned the job of carrying so many pounds. By experience, the designers thought in this case a loading of about 22 pounds per square foot would be most desirable. Dividing the gross estimated weight, 30,000 pounds, by 22, the number of pounds each square foot was to carry, they arrived at a preliminary wing area—about 1400 square feet.

After that the total wing area had to be shaped for best range and efficiency.

So far, the designing was mostly arithmetic. At this point the designers were seized with the doodle urge. There was enough data to make a start, and they just couldn't wait to *see* how the new plane might look. The pencils flew. Sketch after sketch was roughed in. Wing after wing was drawn, examined, rejected; or, if a detail seemed especially good, it was kept.

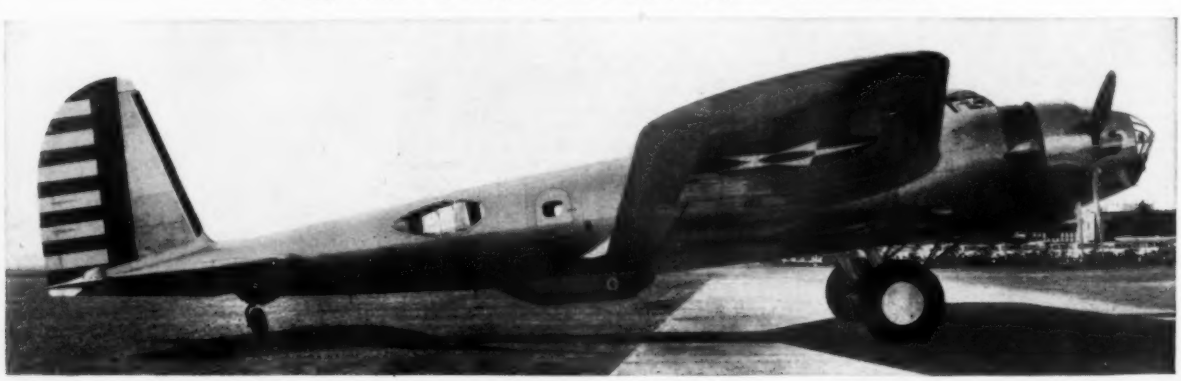
Since the area of the tail surfaces bears a fairly well-established ratio to the area of the wing surfaces, the designers sketched them in the rough, as the wings were sketched, experimentally. Because the bomb-load and number of crew were specified, they could decide within reasonable limits how they should house them. They decided on a circular cross-section for the fuselage, and gave it a streamlined profile.

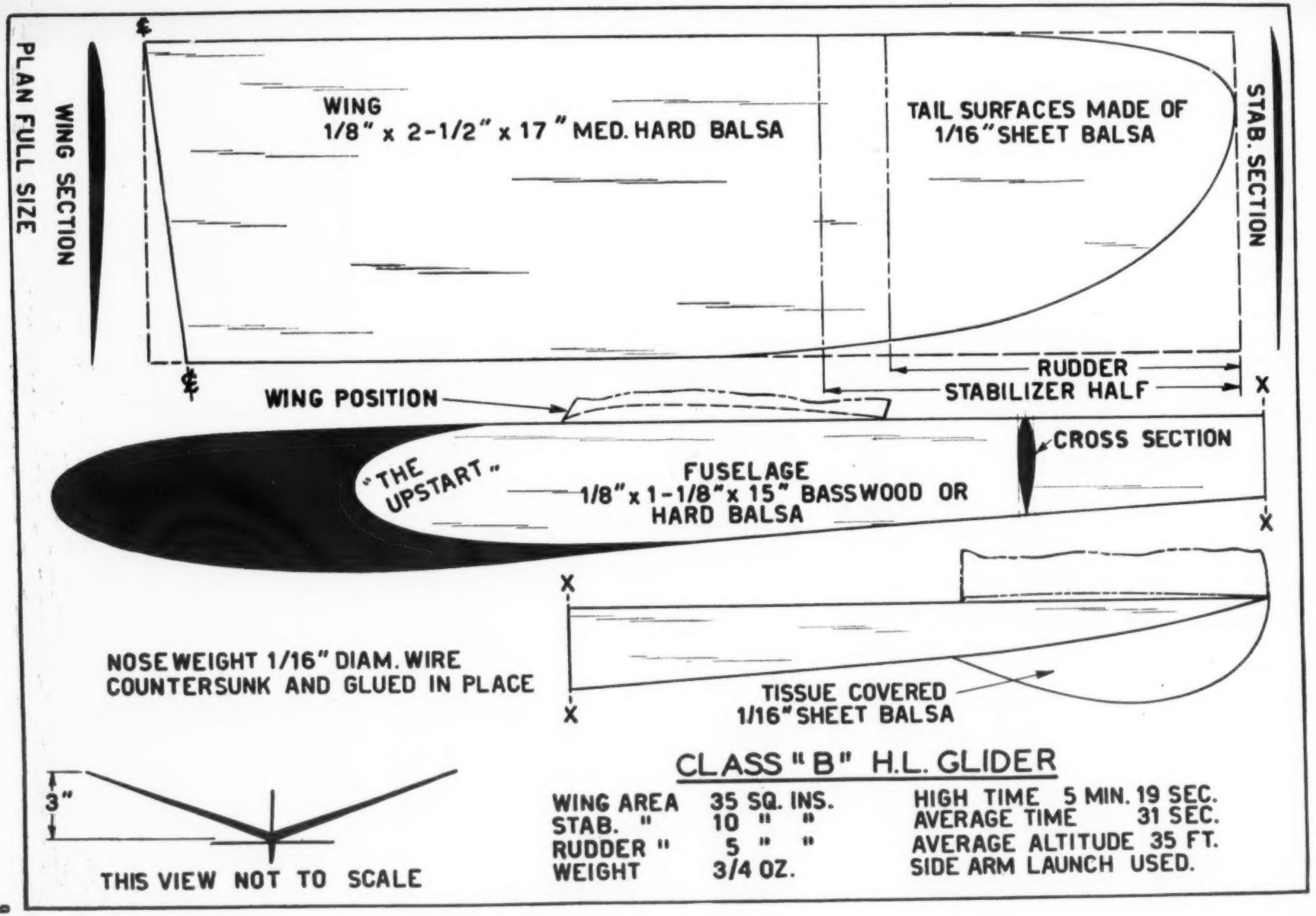
As the landing gear was sketched in tentatively, and the four nacelles, gradually the lethal beauty of the plane evolved. By now the rough drawings were departing from the free-hand doodle. What the designers saw on their drawing boards *should*, they thought, meet the performance characteristics the Army wanted.

Then began the tedious task of checking and rechecking what they thought they

(Continued on page 40)

An early version of the Flying Fortress before tail guns were incorporated





CLASS "B" H.L. GLIDER

WING AREA	35 SQ. INS.	HIGH TIME	5 MIN. 19 SEC.
STAB. "	10 " "	AVERAGE TIME	31 SEC.
RUDDER "	5 " "	AVERAGE ALTITUDE	35 FT.
WEIGHT	3/4 OZ.	SIDE ARM LAUNCH USED.	

MODELING YOUR FUTURE IN AVIATION

Official Air Youth course in elementary aeronautics

by **CHARLES H. GRANT**

Lesson 12—How to Fly Your Basic Test Model Airplane

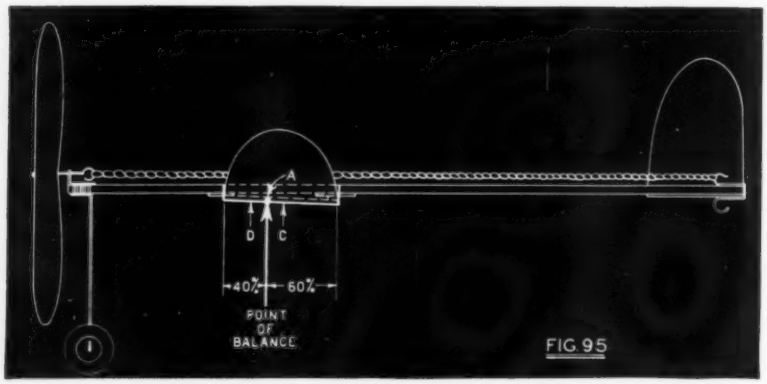


FIG. 95

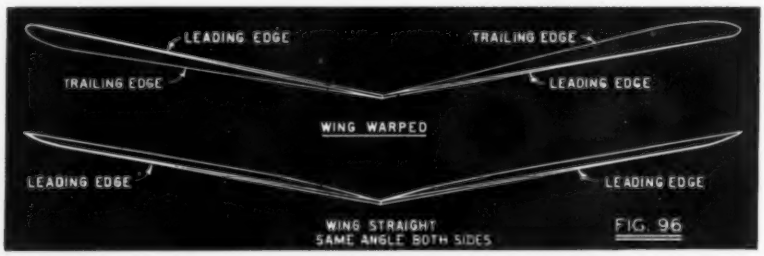


FIG. 96

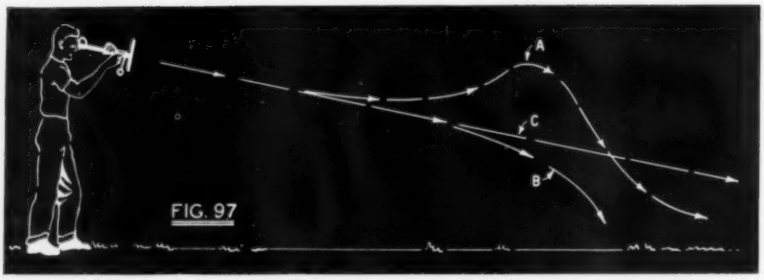


FIG. 97

WITH an air of satisfaction you put the finishing touches to the structure of the simple but graceful test plane on your workbench. There it rests finally completed and ready for flight. You are possessed with an overwhelming desire to see your creation come to life, to see it spread its wings in full flight.

At this moment many modelers make the mistake of rushing the plane to the adjacent yard or street, winding the motor and tossing it haphazardly into the air. Usually the wing adjustment is incorrect and, provided it starts its flight on an even keel in spite of clumsy launching, the little ship stalls, dives or performs some other complex maneuver resulting in a crash landing. Anxiously the modeler rushes to retrieve the plane, hoping the damage is minor. No serious harm may have resulted but only too often a repair job is necessary.

If the flight is by chance successful the modeler suddenly realizes that buildings and other obstacles take delight in placing themselves directly in the model's path. Like their prototypes, the birds, models also have a peculiar liking for trees, most often the higher branches and before the plane is safely in your hands again you belatedly realize that it is better to restrain your desire to fly long enough to take it to some extensive open space and make proper adjustments before a flight is attempted.

So when your plane rests completed on your bench, restrain that inevitable impulse to fly it until a suitable flying field has been selected and the plane is carefully adjusted.

When fully wound the model will fly at least 300 feet, usually in a circle but sometimes straight, so select a flying field at least 300 or 400 feet square without obstructions. Expert fliers can fly this model successfully in more restricted area because they are able to direct the flight in a predetermined manner by appropriate

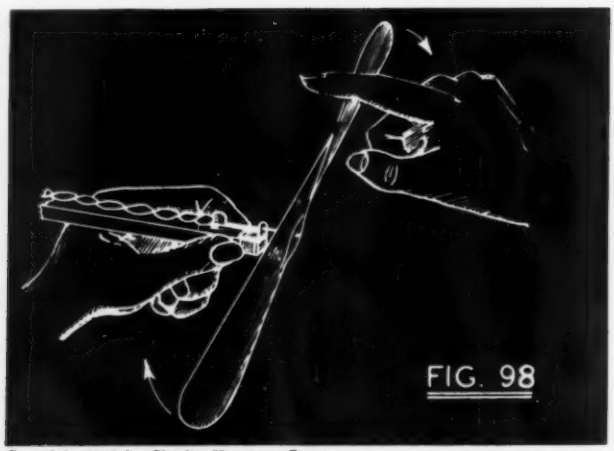


FIG. 98

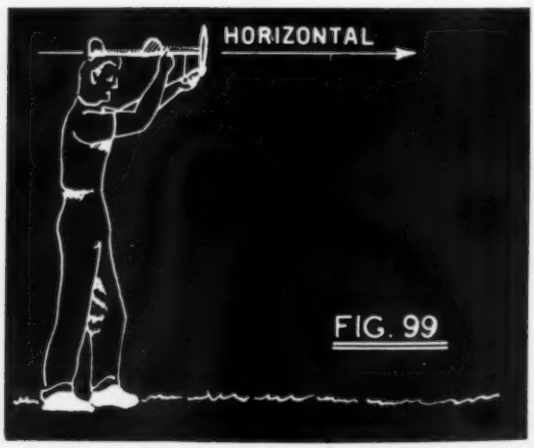


FIG. 99

Copyright 1943 by Charles Hampson Grant

adjustment and launching. But beginners are seldom able to predict the course of flight, so plenty of space is advisable.

Upon arrival at the flying field the first consideration is wind direction, for a model will usually fly and land downwind from the starting point. Also to the windward of the starting point there should be open space, providing smooth air without downdrafts or turbulence usually caused by woods, buildings and other massive obstructions. Turbulent air often causes a plane to act as if it is out of adjustment and prevents accurate estimate of its stability and true flying capacity. A strong wind will also cause trouble even in cleared spaces, so do not attempt your first flights under any conditions if a breeze of more than five miles an hour is blowing; completely calm air is preferable. Such conditions exist most often in early morning, late afternoon or evening.

A model is usually launched into the wind, so it gains altitude quickly. Then due to propeller torque it tends to circle left, drifting downwind while circling. Therefore a starting point about 75 ft. from the windward edge of the field should be chosen. This allows space for the model to gain altitude and turn left before it reaches the edge of the field to windward.

When the air is calm the model may be launched in any direction, but in this case the starting point should be in the center of the field.

It is assumed you have chosen a calm day for your first test flight, so you proceed to the center of the field, depositing your modeler's tool-kit containing cement, spare wood and parts, wire and handy tools such as pliers, knife, etc., at some convenient nearby spot.

Now the big moment has arrived but before flying the plane it must be carefully balanced and adjusted to insure stability. First the wing must be located on the frame stick at the correct point. The heavy vertical arrow, Fig. 95, indicates the point of balance or center of gravity. Move the wing along the stick so its center is slightly to the rear of the point of balance A, as shown. This point can be found by supporting the plane under the wing on two finger tips. Adjust the wing until it is properly located.

Next, while holding the plane with propeller toward you and the frame stick parallel to your line of sight, sight along each wing. Trailing edges must be parallel with leading edges as in lower view of Fig. 96. If the edges are not parallel, the wing being warped as in the upper view, hold the palms of the hands over the top of both wings, with thumbs beneath, one hand on each wing. Then when the wing has been warmed by your hands twist the wing gently back into shape. Hold in this twisted position with the fingers until the wing has cooled again. Then sight from the front of the plane again to see if the wing edges line up properly as in the lower view. Repeat this operation if necessary until the wing is in proper alignment. Check it occasionally as the flights proceed, preferably before each flight.

The completed test model ready to fly

Check the stabilizer and fin for warp in the same manner. Be sure that both are straight, otherwise a normal flight will not result.

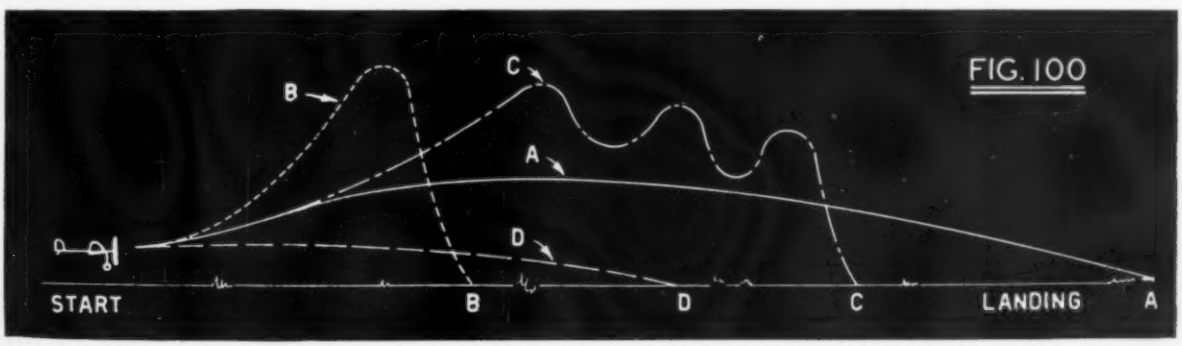
By this time your patience will probably be stretched to the breaking point, but under no circumstance succumb to the urge to fly your plane before it is in perfect adjustment.

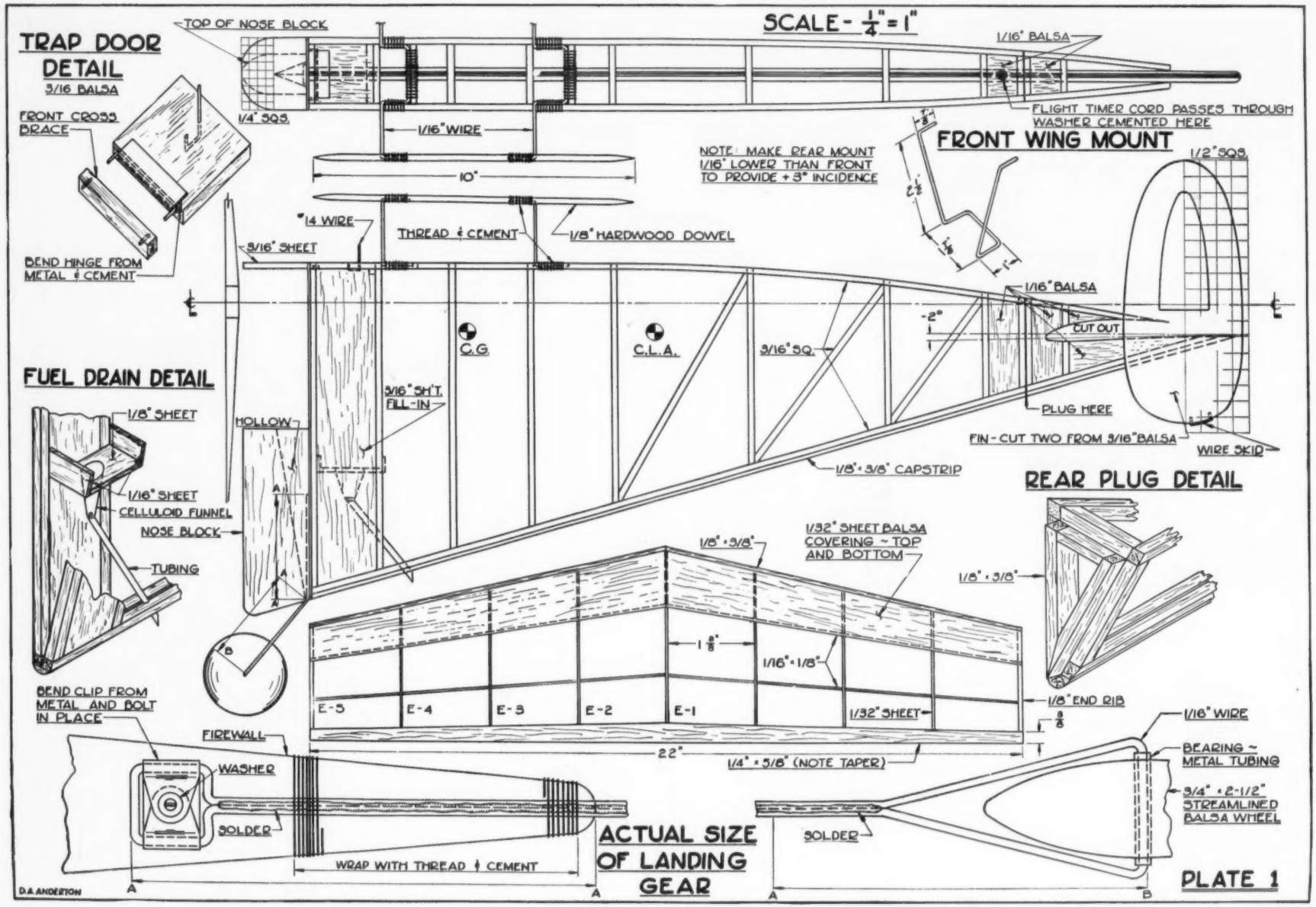
Now your plane is ready to take the air for its first flight—but not with power. The adjustment is tested first by gliding, the success of which depends upon proper launching. Every plane deserves a good start in life, so now concentrate on perfecting your launching technique, the second important step in model flying.

Proceed as follows: 1. Grasp the plane by the frame stick between thumb and forefinger of one hand, immediately in front of the wing. 2. Hold it, facing the wind, on a level with your eye with the plane's nose pointed *slightly* downward as shown in Fig. 97. 3. Toss the model *gently* forward at a slight downward angle. The launching speed should be the approximate gliding speed. If it is thrown too hard the plane will zoom upward and not assume its normal gliding angle, as indicated by path A, Fig. 97. If launched with too little speed it will drop to the ground without gliding, following path B. Path C indicates a normal glide.

When you are certain that you have launched the model properly, observe the glide carefully. If the glide is fast and steep, path B, though launched with proper speed, it indicates that the wing is located too far to the rear of the point of balance A, Fig. 95. If a zooming flight results like path A, Fig. 97, the wing is too far forward. In the former case move the wing forward 1/4"; in the latter move it back on the stick 1/4", test gliding the plane after adjustment. Repeat this procedure if necessary until the plane glides gently and steadily along path C to the ground.

(Continued on page 54)




SCALE - 1/4" = 1"
TRAP DOOR DETAIL
3/16 BALSA
FRONT CROSS BRACE
BEND HINGE FROM METAL & CEMENT
TOP OF NOSE BLOCK
1/4" SQS.
1/16" WIRE
10"
1/16" BALSA
FLIGHT TIMER CORD PASSES THROUGH WASHER CEMENTED HERE
FRONT WING MOUNT
NOTE: MAKE REAR MOUNT 1/16" LOWER THAN FRONT TO PROVIDE + 3° INCIDENCE
1/2" SQS
"14 WIRE
THREAD & CEMENT
1/8" HARDWOOD DOWEL
3/16" SHEET
C.G.
C.L.A.
3/16" SQ.
-2°
1/16" BALSA
CUT OUT
PLUG HERE
FIN - CUT TWO FROM 3/16" BALSA
WIRE SKID
1/8" x 3/8" CAPSTRIP
FUEL DRAIN DETAIL
1/8" SHEET
1/16" SHEET
CELLULOID FUNNEL
NOSE BLOCK
TUBING
HOLLOW
3/16" SH'T. FILL-IN
REAR PLUG DETAIL
1/8" x 3/8"
1/32" SHEET BALSA COVERING - TOP AND BOTTOM
1 5/8"
1/16" x 1/8"
1/8" END RIB
E-5
E-4
E-3
E-2
E-1
1/32" SHEET
22"
1/4" x 3/8" (NOTE TAPER)
BEND CLIP FROM METAL AND BOLT IN PLACE
FIREWALL
WASHER
SOLDER
WRAP WITH THREAD & CEMENT
A
A
ACTUAL SIZE OF LANDING GEAR
1/16" WIRE
BEARING - METAL TUBING
3/4" x 2-1/2" STREAMLINED BALSA WHEEL
SOLDER
A
B
D.A. ANDERTON
PLATE 1

"VEE" FOR VICTORY

How to build this completely stable high-performance gas model

by RALPH J. ULLENBERG

TEST flying a model is usually a trying experience for its builder . . . He realizes a crisis is at hand . . . His nerves are tense . . . His imagination stirs . . . Before every flight he alternately sees visions of the new model executing unequaled performance or striking the sod with destructive violence.

Test flying the "Vee," however, was a refreshing relief. Its very first flight was almost perfect; adjustments were unnecessary. Stability was by no means a stranger and subsequent flights proved the craft faithfully consistent and absurdly easy to fly.

The high aspect ratio wing may be viewed somewhat askance by those advocates of the short stubby variety. Nevertheless its use was justified. The rate of climb was perceptibly increased, and the long slithering glide revealed a decided tendency to alienate "ole mama" earth. Even if you are not planning on building another gas model at present, the wing may prove especially adaptable to that new soaring glider design you have in mind.

Two of these models have already been built, and two slightly modified versions, of Class A and B distinction, were also built and flown with sparkling performance.

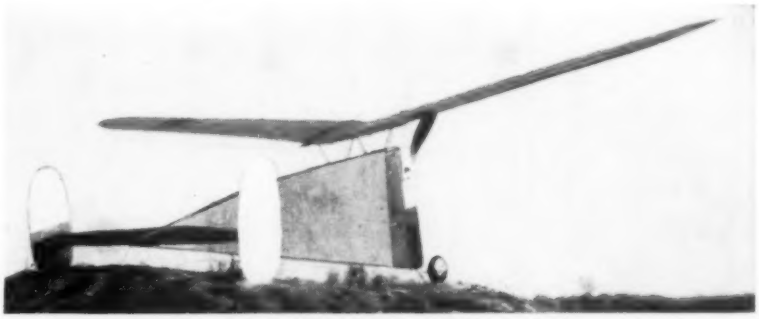
Balsa construction is used throughout. If you happen to be possessed of only a limited stock it is suggested that basswood could be incorporated wherever you deem it advisable. Use your discrimination in this. Strive to blend proper strength with reasonable weight.

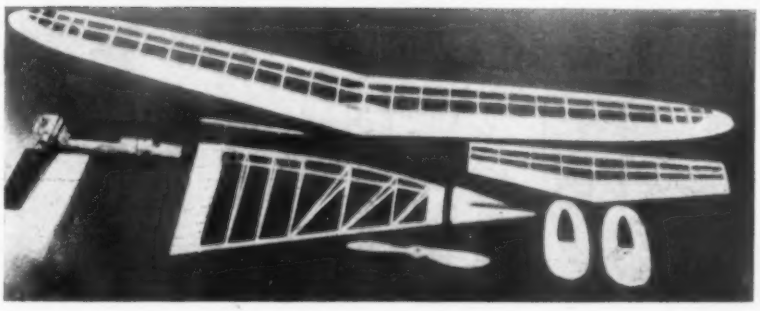
After enlarging the drawings to workable size, a protective covering of waxed paper over them would not be out of place.

Constructing both sides of the fuselage at the same time, one atop the other, will prove most accurate and convenient. Needless to say, extra coatings of glue at vital joints would be very good modeling sense. Lower longerons of the completed sides are now cemented together, and upper cross braces added between the top longerons. A 1/8" x 3/8" cap strip is cemented to the bottom of the lower longerons and the edges rounded. Inlay the framework with sheet wherever indicated. The fuselage, at this point, would thank you for a neat job of sanding, so be a sport and kindly oblige.

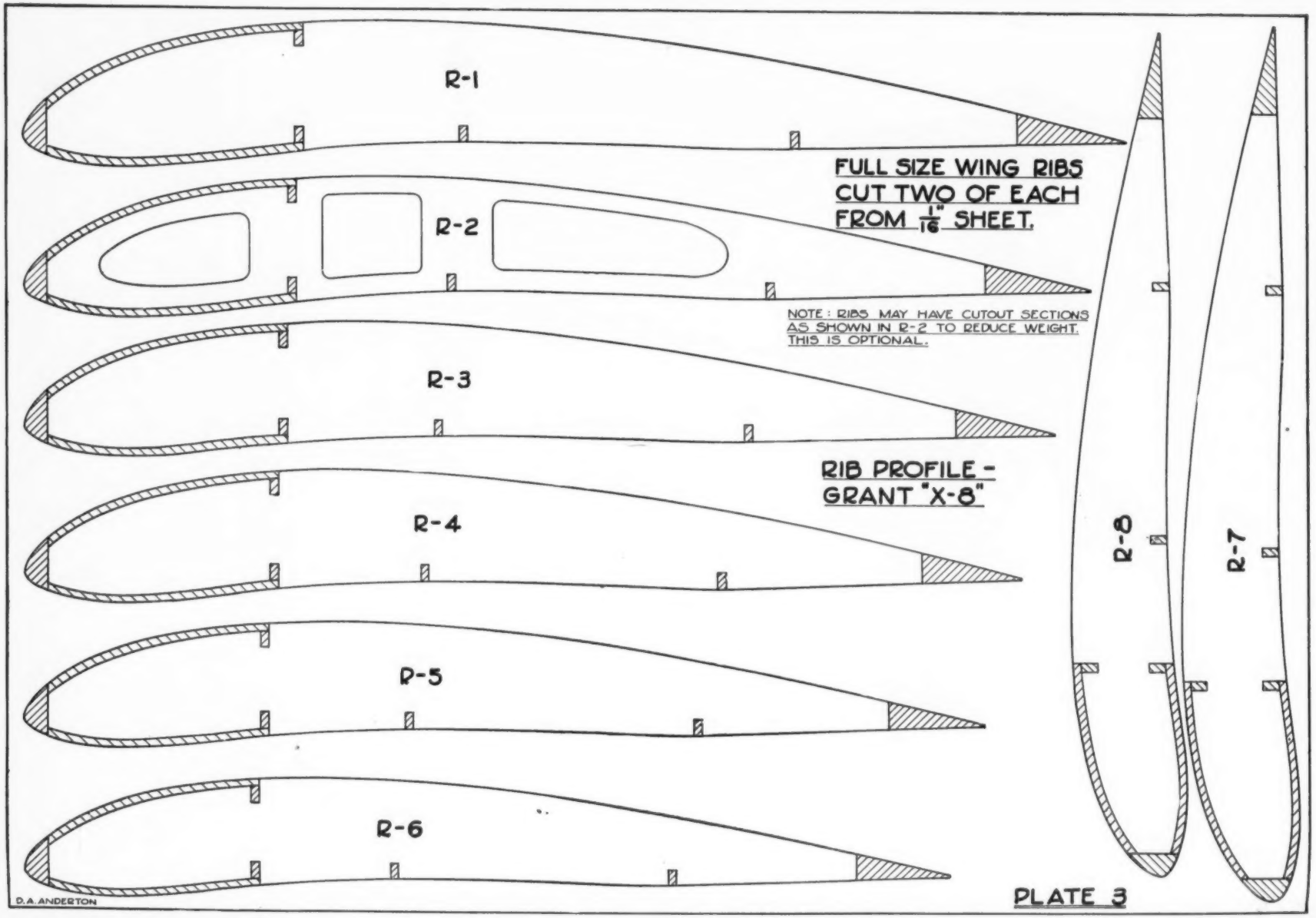
(Continued on page 52)

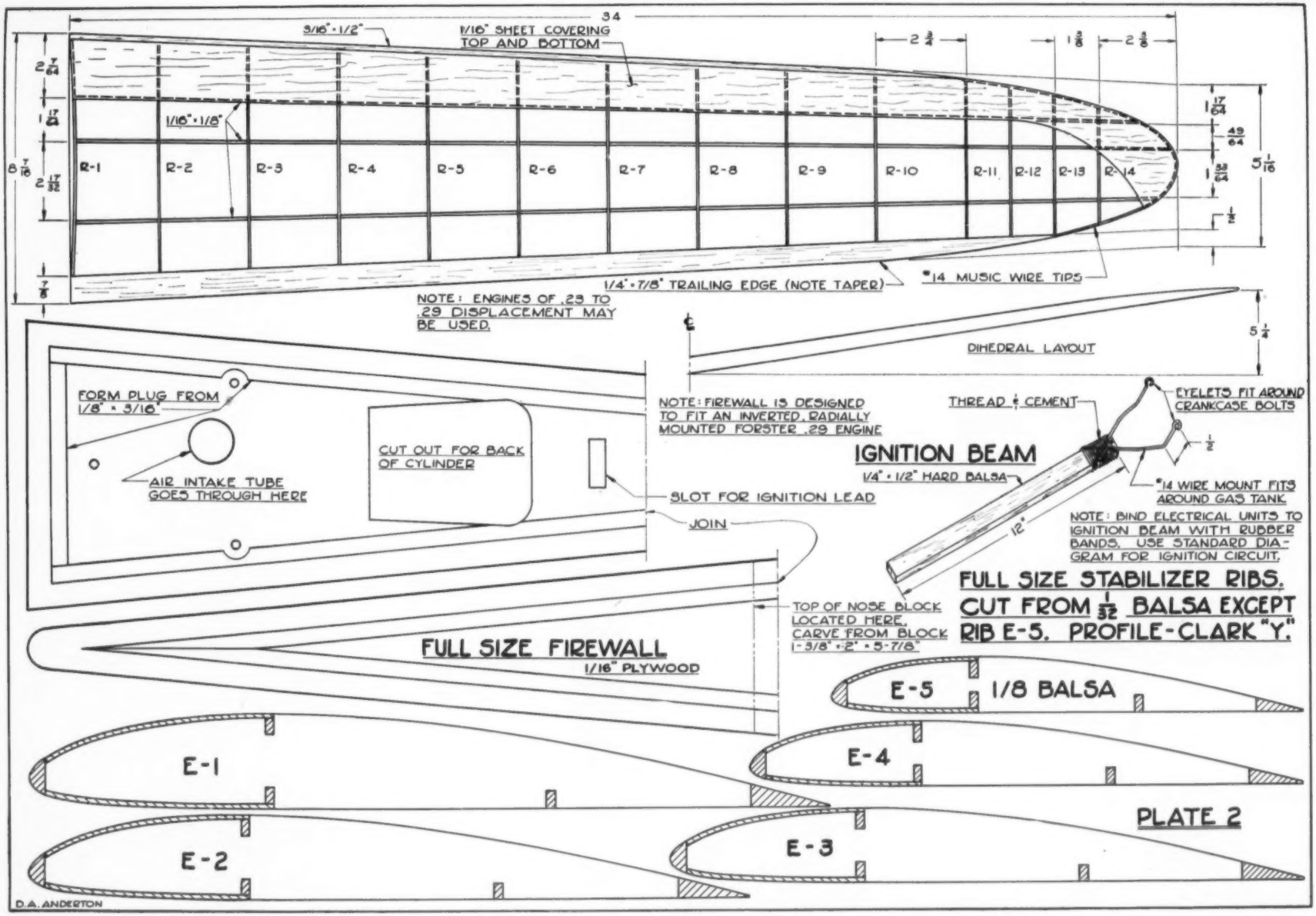
Much merit for the "Vee's" success must be saddled on Mr. Charles Grant. I would like to spare Mr. Grant his modest blushes, but honor compels me to mention that the design is based largely on his series of design articles presented in both M.A.N. and his book, *"Model Airplane Design and Theory of Flight"*. Recognition is also due to Mr. Edward Pietrzak for his practical advice, Mr. James Gilchrist for his fine job of constructing an extra model for experimental purposes and Mr. Edward Krause for his inspiring encouragement.

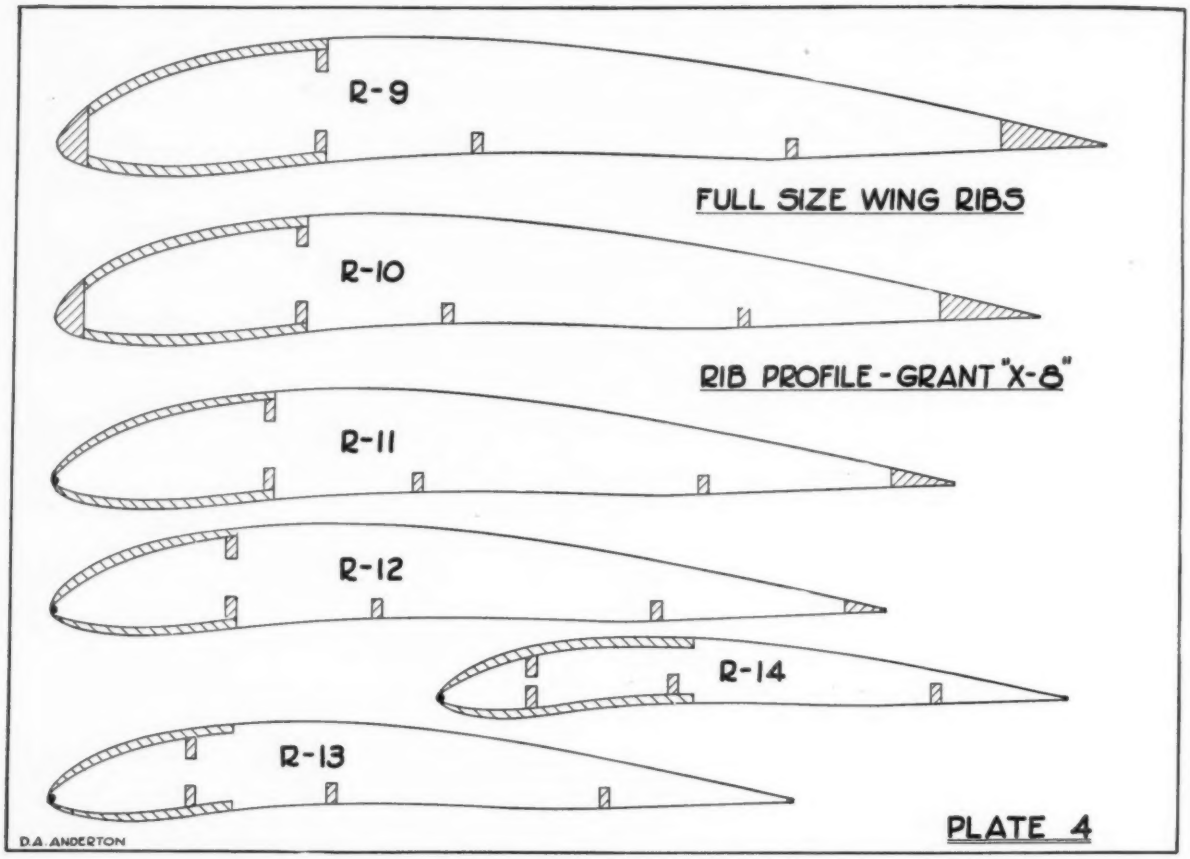




Top **The high aspect ratio soaring gas job, stable in any wind.** *Top right* **A deep body makes it stable in all kinds of weather.** *Right* **Structure is simple and all parts are easily demounted**


R-1
R-2
R-3
R-4
R-5
R-6
R-7
R-8
FULL SIZE WING RIBS
CUT TWO OF EACH
FROM 1/16" SHEET.
NOTE: RIBS MAY HAVE CUTOUT SECTIONS AS SHOWN IN R-2 TO REDUCE WEIGHT. THIS IS OPTIONAL.
RIB PROFILE -
GRANT "X-8"
D.A. ANDERTON
PLATE 3


34
3/16" • 1/2"
1/16" SHEET COVERING TOP AND BOTTOM
1/16" • 1/8"
R-1
R-2
R-3
R-4
R-5
R-6
R-7
R-8
R-9
R-10
R-11
R-12
R-13
R-14
1/4" • 7/8" TRAILING EDGE (NOTE TAPER)
#14 MUSIC WIRE TIPS
NOTE: ENGINES OF .23 TO .29 DISPLACEMENT MAY BE USED.
DIHEDRAL LAYOUT
FORM PLUG FROM 1/8" • 3/16"
AIR INTAKE TUBE GOES THROUGH HERE
CUT OUT FOR BACK OF CYLINDER
NOTE: FIREWALL IS DESIGNED TO FIT AN INVERTED, RADIALLY MOUNTED FORSTER .29 ENGINE
SLOT FOR IGNITION LEAD
JOIN
THREAD & CEMENT
EYELETS FIT AROUND CRANKCASE BOLTS
IGNITION BEAM
1/4" • 1/2" HARD BALSA
#14 WIRE MOUNT FITS AROUND GAS TANK
12"
NOTE: BIND ELECTRICAL UNITS TO IGNITION BEAM WITH RUBBER BANDS. USE STANDARD DIAGRAM FOR IGNITION CIRCUIT.
FULL SIZE STABILIZER RIBS. CUT FROM 1/32 BALSA EXCEPT RIB E-5. PROFILE-CLARK "Y."
TOP OF NOSE BLOCK LOCATED HERE. CARVE FROM BLOCK 1-3/8" • 2" • 5-7/8"
FULL SIZE FIREWALL
1/16" PLYWOOD
E-5
1/8 BALSA
E-1
E-4
E-2
E-3
PLATE 2
D.A. ANDERTON



SKYWRITER'S LIBRARY

Aeronautical books recently published

JANE'S ALL THE WORLD'S AIRCRAFT—1941. Compiled and Edited by Leonard Bridgman (The Macmillan Company, New York City), 558 pages. $19.00.

This giant volume continues to hold its high rating as the world's outstanding aircraft information and data book and once again Editor Leonard Bridgman and Founder Fred T. Jane have compiled an unbelievable reference volume on *all* military and commercial airplanes, airlines, military organizations, etc., of *all* nations represented by aircraft manufacturers. The 1941 issue is particularly valuable in the information contained on the present status of occupied countries of Europe and their controlled aircraft industries. All the very latest military airplanes are covered quite thoroughly although performance figures have been omitted in some cases for obvious reasons. The Luftwaffe and the Japanese Air Force are covered quite thoroughly, as is the Regia Aeronautica, giving valuable details, including performance, of the planes of Germany, Japan and Italy. This huge volume is completely illustrated, containing the finest collection of aircraft photographs ever published. No aeronautical bookshelf is complete without "Jane's" year after year and the 1941 volume keeps pace, in every respect, with the series of earlier works.

JANE'S FIGHTING SHIPS—1941. Compiled and Edited by Francis E. McMurtrie (The Macmillan Company, New York City), 530 pages. $19.00.

This outstanding volume, a companion to "All The World's Aircraft," is the world's outstanding reference work on the naval vessels of the world and is actually the only thorough and complete encyclopedia on the subject. "Jane's" is mentioned frequently in official dispatches as the source of data on vessels mentioned in the news. Of particular interest is the complete data on the world's aircraft carriers as well as airplane-carrying battleships and cruisers and mention of several plane-carrying submarines. It contains over 3,000 photographs and drawings of naval warships and is a source of endless interest in naval warfare.

THE GUILT OF THE GERMAN ARMY, by Hans Ernest Fried (The Macmillan Company, New York City), 426 pages. $3.50.

To the knowing military analysts who have long held that this present conflict is but a continuation of the first great World War and that the ruling class of German warriors have, for many years, held Germany captive and plotted habitual wars against the world, the book will come as a welcome panacea. In completed documented form, Fried has told the complete story of the German war lords from pre-1914 times to the present and given a more lucid picture of the forces which gave National Socialism its birth than even "Mein Kampf." The volume contains complete tables in the appendix on German Army Personnel and is fully annotated.

ADVENTURE WAS THE COMPASS, by Alma Heflin (Little, Brown & Co., Boston, Mass.), 285 pages. $2.75.

This volume ushers in the era of the aviation travelog which is destined to far outshine the copious volumes dealing with ships, pack trains and caravans across deserts, jungles and into strange lands.

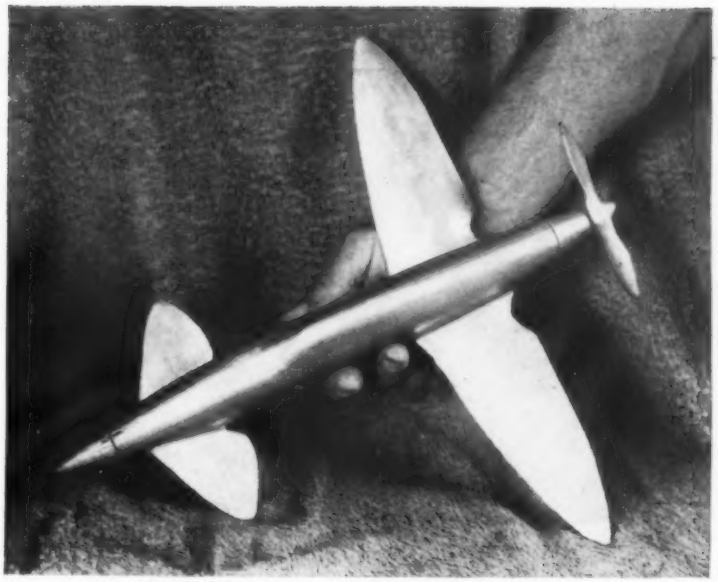
Alma Heflin and Margie McQuin, with nerve few men have, embarked on a trip to Alaska in a tiny Piper Cub, which they named "Mister Shrdlu" and which bore them across adventure-packed Alaska not entirely without incident. Alma Heflin, well-known aviation writer, tells a refreshing tale which will stimulate the chronic traveler as well as the stay-at-home.

(Continued on page 36)

FLYING MODELS UNDER WATER

How you can flight-test solid hardwood models of various types without danger of breakage

by **RAY EDMISTON**



A rubber powered underwater pusher model of advanced design

FOR you model airplane builders who have begun to sweat and fret about the shortage of balsa, rubber and other essential parts, this new and fascinating phase of the game should be of great interest. How many of you ever thought of flying your model planes under water? If you have never tried, you have a new thrill coming.

Every plane builder who has made small scale models has at some time looked at the finished product and wished the thing would "just fly." Well, now you can fly your scale models and test them in a "watery wind tunnel." And the good effects about this type of flying are: There are no crack-ups and the whole flight of the plane can be observed in "slow motion." These two features alone are well worth your delving into this new, interesting sport.

Next, the models can be made from any kind of wood available. All model builders are fast awakening to the fact that pine is an ideal wood to work with, although it can not be carved quite so easily as balsa. Pine is much stronger than balsa for scale model work used for under water flights.

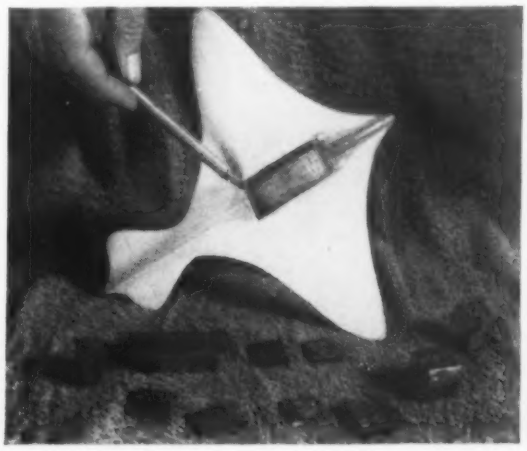
In a swimming pool down in Ft. Myers, Florida, we have spent many hours lately watching Larry Leash, pioneer airplane inventor, flying these models under water. Leash has a long string of airplane patents to his credit and is a member of the Early Birds, an organization of pioneer airplane and glider pilots. Many of Leash's models are rubber powered; some of the most interesting are simple gliders.

You'll probably scratch your head and wonder how you can glide a plane under water. Well, we have seen Leash dive into the deep end of the pool wearing a pair of water goggles and release a glider from the bottom. The model took off in a slow upward glide and traveled the whole length of the pool before coming to the surface. We have seen him release a 15" rubber powered Bell Airacobra in knee-deep water. The plane would fly in a wide circle, bank, and dive according to the way the rudder and movable ailerons were set. Sometimes the plane would circle and come to the surface within a few feet from where it was released. After chasing gas models over hills and through valleys of Ohio, this feature alone looked to us like a good way to save patience and shoe leather.

Now let's go into a few details on the building and flying of underwater models. It is best to start with a medium sized model; a 12" or 15" model will be best. The underwater performance is controlled mainly by addition of lead weights in the body of the model. The amount of weight used and the position of it must be variable as a great amount of adjustment is neces-

(Continued on page 58)

Left The rubber powered pusher "takes off" for a slow motion flight under water. *Right* A Manta glider with cavity in body for weights and corks



FRONTIERS

Latest developments in the science of air war

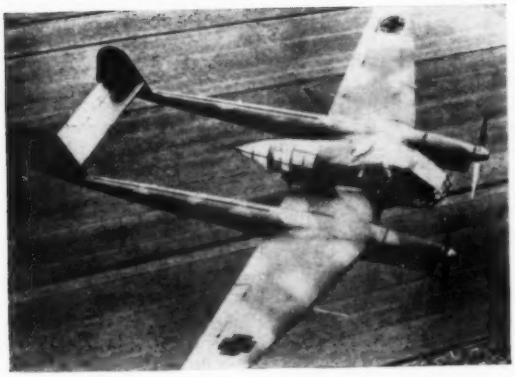
AS THIS is written, heavy bombers of the British and American airforces are demonstrating their ability effectively as long range artillery. Without cessation, night after night, they are pulverizing Germany's war industries, and demonstrating to the German people that they cannot give blows without receiving them.

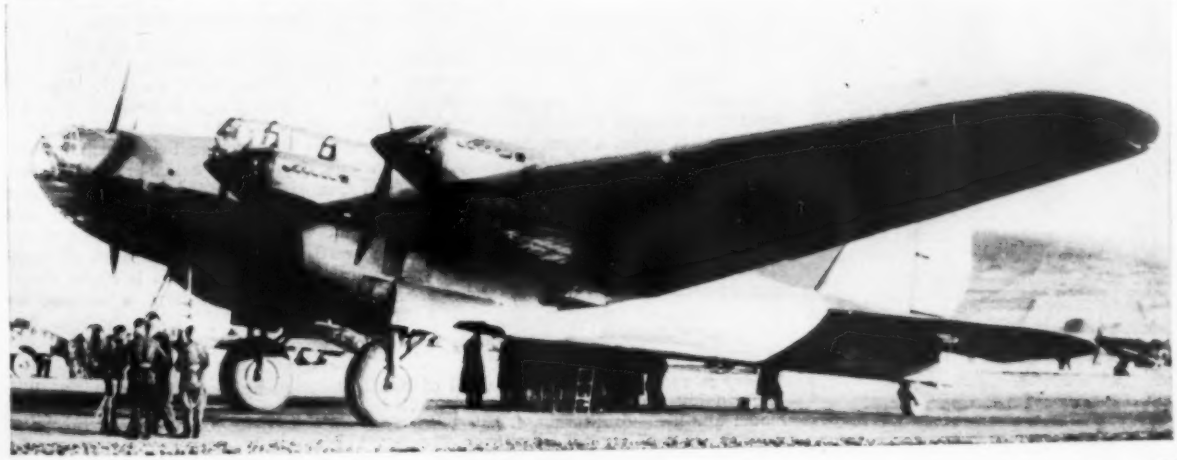
Before the advent of the airplane, war plants nestled safely behind strongly fortified lines and the battle was decided by combat forces on the ground. Today no element of war is safe from attack and destruction, and fighting is more fluid and universal over large expanses of territory. Air power has created this great change, making available an attack for which there is, at present, no adequate defense. Ground forces are essential but air power will decide the issue because ground forces can only win engagements when their side has control of the air.

At this juncture it is not possible to estimate the damage done by the unrelenting bombing of German war industries; certainly such information will be withheld by the Germans themselves. However the British are in a position to estimate this damage quite accurately on the basis of their own experience when Germany bombed England. Evidently the picture looks favorable because bombing continues without let-up. We read that hundreds of bombers carrying 8 tons or more of explosives fly over Germany, deposit their loads and return, night after

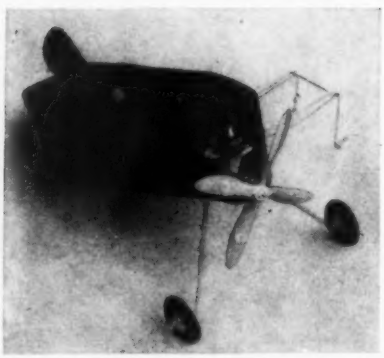
(Continued on page 44)

VNON





AIR WAYS



News of model plane experimenters from all parts of the world

THE ranks of expert model builders are becoming thinner with each passing day, for, one by one they are joining Uncle Sam's armed forces or performing some useful task in war production. We are proud indeed that model aviation has been able to render such an invaluable service in preparing these young men in the defense of their country.

There is less news concerning model activities to publish in Air Ways; however, there is a new and fine group of model builders now being educated in aeronautics in schools, clubs and national organizations. Many of these are beginners and few as yet are experts.

It is not necessary to be an expert to have pictures of your planes and news of your activities published in *Air Ways*, so if you are a newcomer and feel that you have something of interest to other modelers, or something you would like to see in print, do not hesitate to send your contribution to: *Air Ways*, MODEL AIRPLANE NEWS, 551 Fifth Avenue, New York City. When contributing pictures be sure they are clear and that the background is not confusing; otherwise they cannot be reproduced satisfactorily. When taking pictures be sure of the following facts: the focus is perfect. The background is not confusing, and of some tone different from the objective; if the object is white, a black background is best; if the object is black, white is best. Gray is excellent for average subject but the background should be a darker or lighter gray than the subject itself. A 3/4 front view of planes taken slightly from above usually proves to be most satisfactory, because from this position all features are clearly shown.

This month we have a number of interesting pictures. Picture 1 comes from Donald Hughes, 2245 S. Beverly Glen, W. Los Angeles, Calif., and shows one of his latest gas models of original design powered by a .19 cu. in. engine. He says:

"Though it was intended for a sport flying ship it has turned in many flights of contest performance, the longest being 12 min. It started out as a gull wing type, wings mounted directly on the fuselage. This proved unsuccessful so I added a 3" pylon and polyhedral and then it was a good ship. It now has better than 60 flights on her log and is ready for more.

"I would also like to mention that I work at Douglas Aircraft Inc., and consider my model aircraft experience invaluable. Without it I would not have been hired for my position in the Research Department.

"I would like to hear from anyone in this area who is interested in forming a model club."

Hughes' ship is a very unusual job. Its design is nearly perfect; you will note that though the wing is high the thrust line also is high, the center of gravity probably being on or slightly below the thrust line. This makes for longitudinal stability. Also the center of lateral area is properly placed—it is quite low. The fin is fairly low compared to the area in the front. In other words, if you draw a line from the center of area of the rear half of the plane's side projection and through the center of area of the front half, the line will be sloped upward slightly. This helps to eliminate spiral diving. If this axis is sloped downward the ship will have a tendency to

1. *Top* A sport or contest gas model of excellent design by Donald Hughes. 2. Bill McReynolds' flying "pie plate" (U-controlled). 3. A Brewster Buffalo exact scale gas model that flies beautifully. 4. *Left* Frank Gue with his Class C contest stick model, a most consistent flier in all kinds of weather

spiral tightly. A good rule is: keep the tail area low relatively to the side area of the front part of the ship.

Bill McReynolds of 2300 York St., Quincy, Ill., sends us picture 2 showing one of the most interesting planes we have seen to date. He calls it his "pie plate," but it looks very much like the proverbial "barn door." The old saying goes: "You can make a barn door fly if you apply enough power." McReynolds has powered his ship with a .23 engine mounting a 4-bladed propeller and it is rigged up as a U-control plane, and, believe it or not, this little job has hit 95 mph. for 2 laps. On the left side of the plane can be seen the wire outriggers holding the U-control lines. A smaller model now under construction will have landing flaps and will be powered by a .60 engine.

Edward Lutter of 5546 Upland St., Philadelphia, sends us picture 3 showing his gas powered Brewster Buffalo. It is built carefully to scale and is a neat looking job. It has a wingspan of 33", is powered with an Atom engine. The cockpit hatch slides, allowing access to the timer, while the landing gear is retractable. The cowl and landing gear fairings are removed when the model is flown. This is not a G-line model and makes a beautiful free flight. Lutter says it required 6 weeks to build.

Picture 4 shows Frank S. Gue of 10508-71 Ave., Edmonton, Alta., Canada, with his 150" Class C contest stick model. He says the little ship gives justification to the "motor length at any cost" theory; she goes out of sight on a contest winding and the glide is smooth and flat. Mr. Gue says that the boys in his community "dig out" all the old crates during the winter and fly them when the temperature gets above 20 degrees. He says:

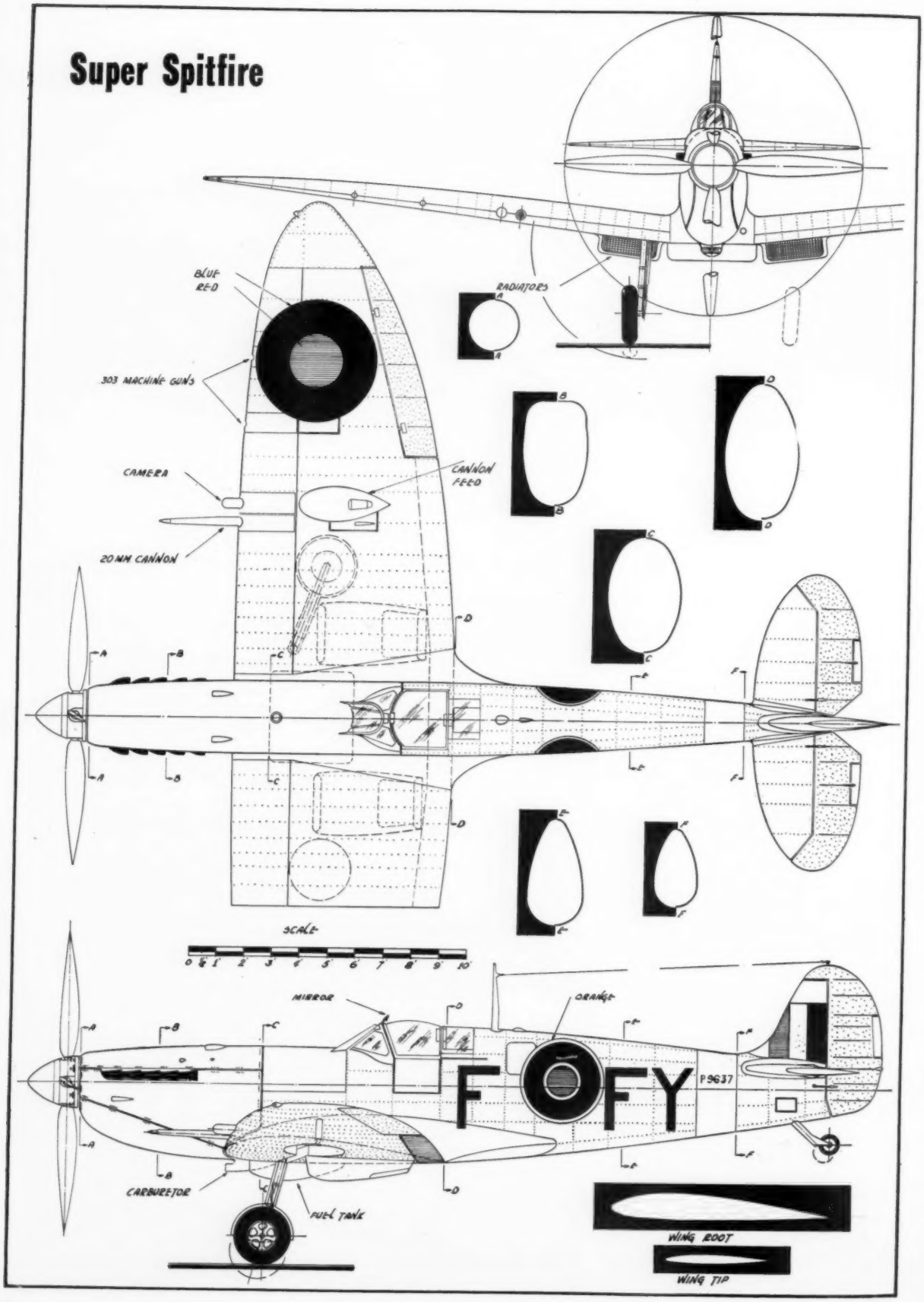
"It isn't supposed to be conducive to good performance but we haven't had any trouble yet with the rubber, and have even flown in 19 below zero."

Usually cold weather hardens rubber and makes it very brittle so that it delivers

(Continued on page 34)

5. *Top* **A carefully detailed scale model of a Boeing P-26A by Clifford Coulbert. 6.** *Second from Top* **Champion Leta McAllister of the San Diego Aeroneers. 7.** *Third* **John Reynolds' hardwood gas job and his faithful mascot. 8.** *Below Right* **This U-control Curtiss P-40D is a thrill to pilot, says Eut Tileston. 9.** *Below* **An experimental ski plane with an aspect ratio of 18, by Donald Paige**

Super Spitfire



SUPER SPITFIRE

(British Combine Photos)

The plane on the cover

EASILY the most outstanding fighter design developed thus far in the present war is the Vickers Supermarine Spitfire, which has been accorded the enviable position of peerage over every other design now in action. And this distinction has been gained in action, for the Spitfire has downed more enemy aircraft than any other single type regardless of nationality or manufacturer. The first enemy plane to fall on British soil was shot down by a Spitfire piloted by Squadron Leader Farquhar, D.F.C. on October 28th, 1939. Spitfires shot down a total of 108 enemy planes out of 200 downed during the escape from Dunkirk during the first week in June, 1941. During the Battle of Britain, Spitfires of No. 11 Fighter Group destroyed 442 enemy planes between September 11th and October 5th, 1940. And it was recently reported that a Spitfire ascended to 50,000 ft. over the Libyan desert to destroy a German airplane! Certainly its widespread publicity is justified.

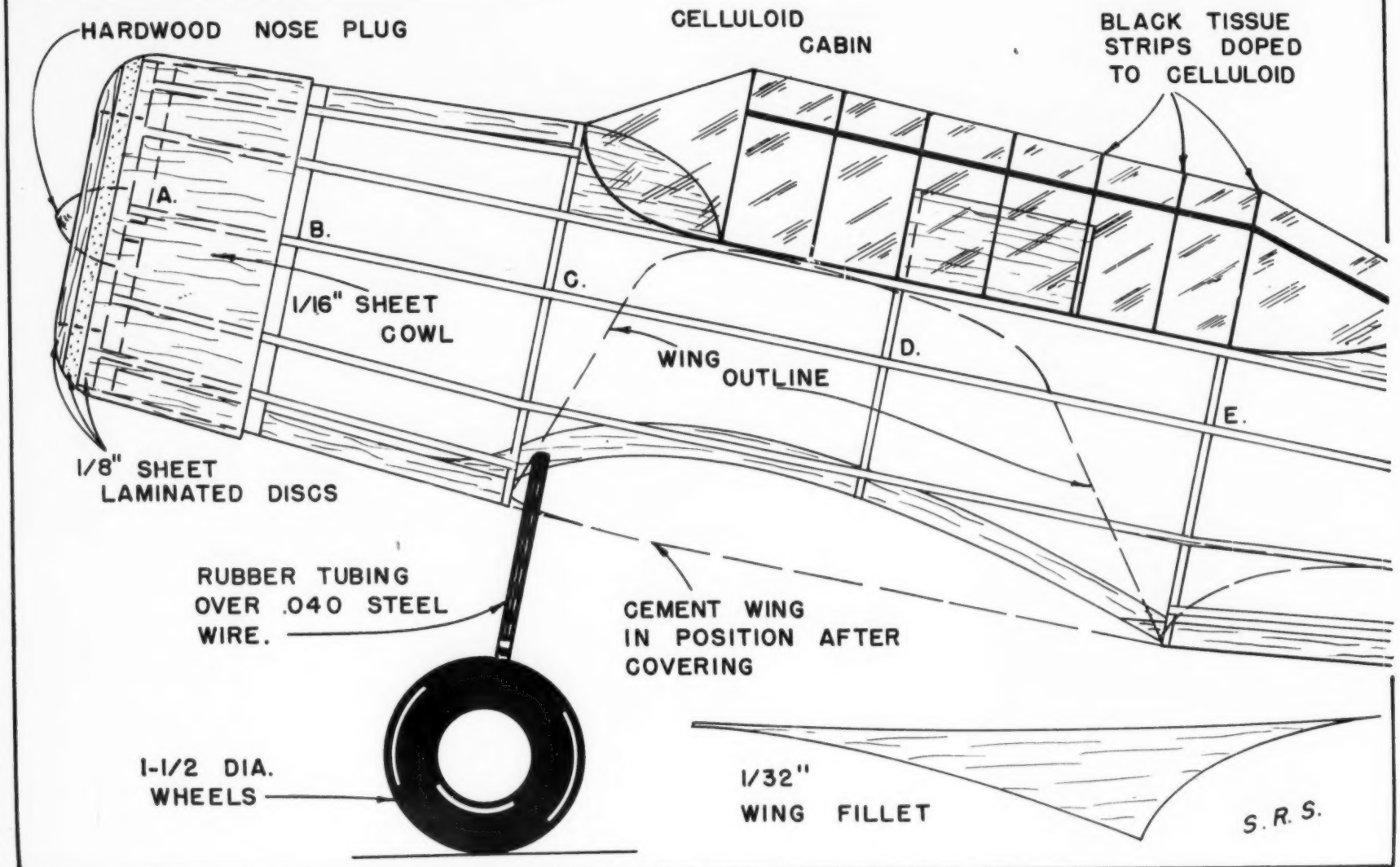
But the Spitfire was not born of spontaneous generation, rather is it the culmination of two decades of research, trial and perfection. And it began in 1912 when Mr. Noel Pemberton Billing organized the Supermarine Aviation Works at Woolston, Southampton, England. The following year the first Supermarine airplane appeared, a biplane flyingboat known as the P.B.1. Shortly after Mr. Billing sold his interests in the firm to Mr. Hubert Scott-Paine who was later joined by Commander James Bird. Within their engineering department was young Mr. R. J. Mitchell, whose genius for design soon advanced him to the position of chief engineer. During the war the Supermarine works continued to design and build flyingboats (as it continued to do up until 1938) with meager success and the close of the war found it barely solvent.

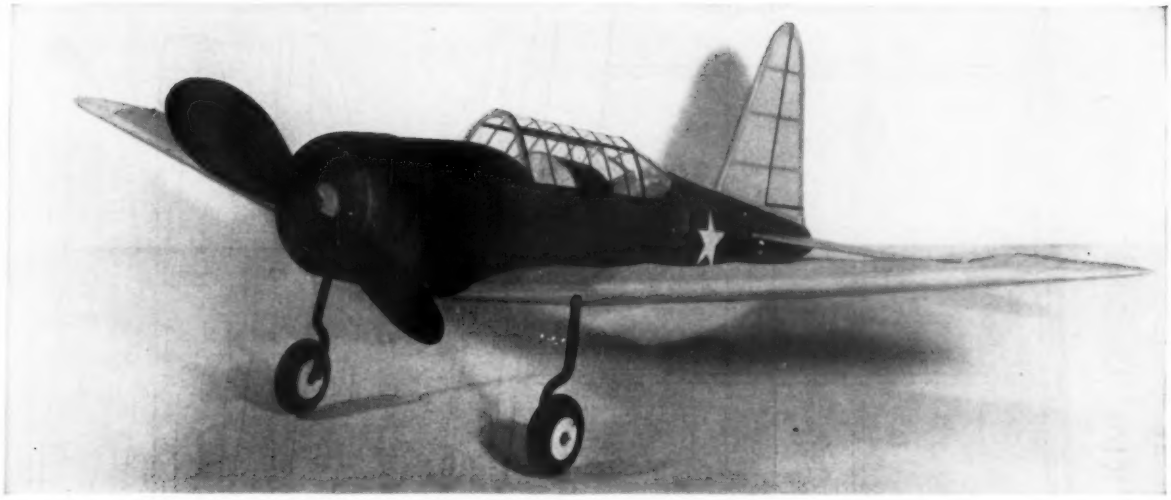
In 1922 the designers of the British aircraft industry were on a spot: the famed Schneider Trophy Contest had been won two years in succession (1920 and 1921) by Italy and a victory in 1922 would have made them permanent holders of the trophy. There being only float-equipped biplanes of World War I vintage available, Supermarine appeared the only logical firm to compete. Mr. Scott-Paine and Commander Bird dug deeply into their own pockets (contrary to popular opinion, Great Britain did *not* finance the British entries in the contests) and decided to build a challenger for the trophy. At that instant the Spitfire

(Continued on page 59)

The world's foremost pursuit plane maneuvers for the "kill"

VULTEE VALIANT BT-15





BUILDING THE VULTEE VALIANT

A realistic model of the famous U. S. Army trainer, that is easily built

by **SYDNEY STRUHL**

LATEST in the series of Vultee basic trainers used by the United States Army Air Corps which began auspiciously with the BT-13, the Valiant now serves as the BT-13A or BT-15, depending on engine installation. Powered by either Pratt & Whitney or Wright radial engine developing 450 hp., the Valiant has a top speed of 182 mph. and a service ceiling of 21,000 feet. It has a wingspan of 42 ft., is 28 ft., 7 in. long, and measures 9 ft., 1 in. in overall height.

This fine training plane, designed expressly for the U.S.A.A.F., is the backbone of our Air Cadets' basic flight training; practically every one of our boys who sprouts wings on his tunic soloed in this plane. The Valiant is ideally suited for rough training routines. Being extremely rugged and stable, Cadets with "air sense" find little difficulty in learning to fly and solo in one of these ships even with 450 hp. mounted in the nose.

Incidentally, the author got a rather odd "kick" out of modeling this basic trainer, for being an Aviation Cadet in Uncle Sam's Enlisted Reserve, he expects to be sitting in the cockpit of a BT-15 very shortly.

The model has been accurately reproduced and is worthy of any effort expended on its construction. It is not only attractive as a display model but is also a speedy, stable flier. Because of its excellent proportions it is ideal for scale endurance meets.

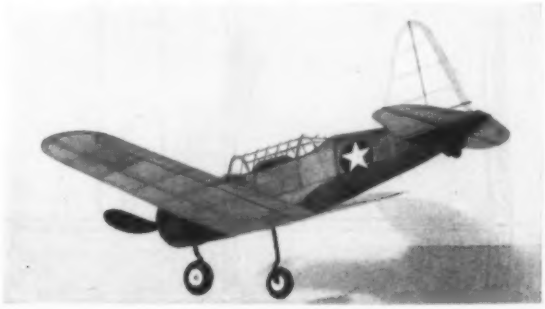
The model Valiant is simply constructed in the conventional manner. While the test ship was built of half balsa and half pine, the plans call for all balsa which is of course the best material. However it is readily adaptable to construction using slightly heavier white pine and basswood now being sold at most model shops. All wood should be selected carefully to assure the lightest, strongest structure possible. In the process of assembly all frames should be made with accuracy and each joint cemented firmly.

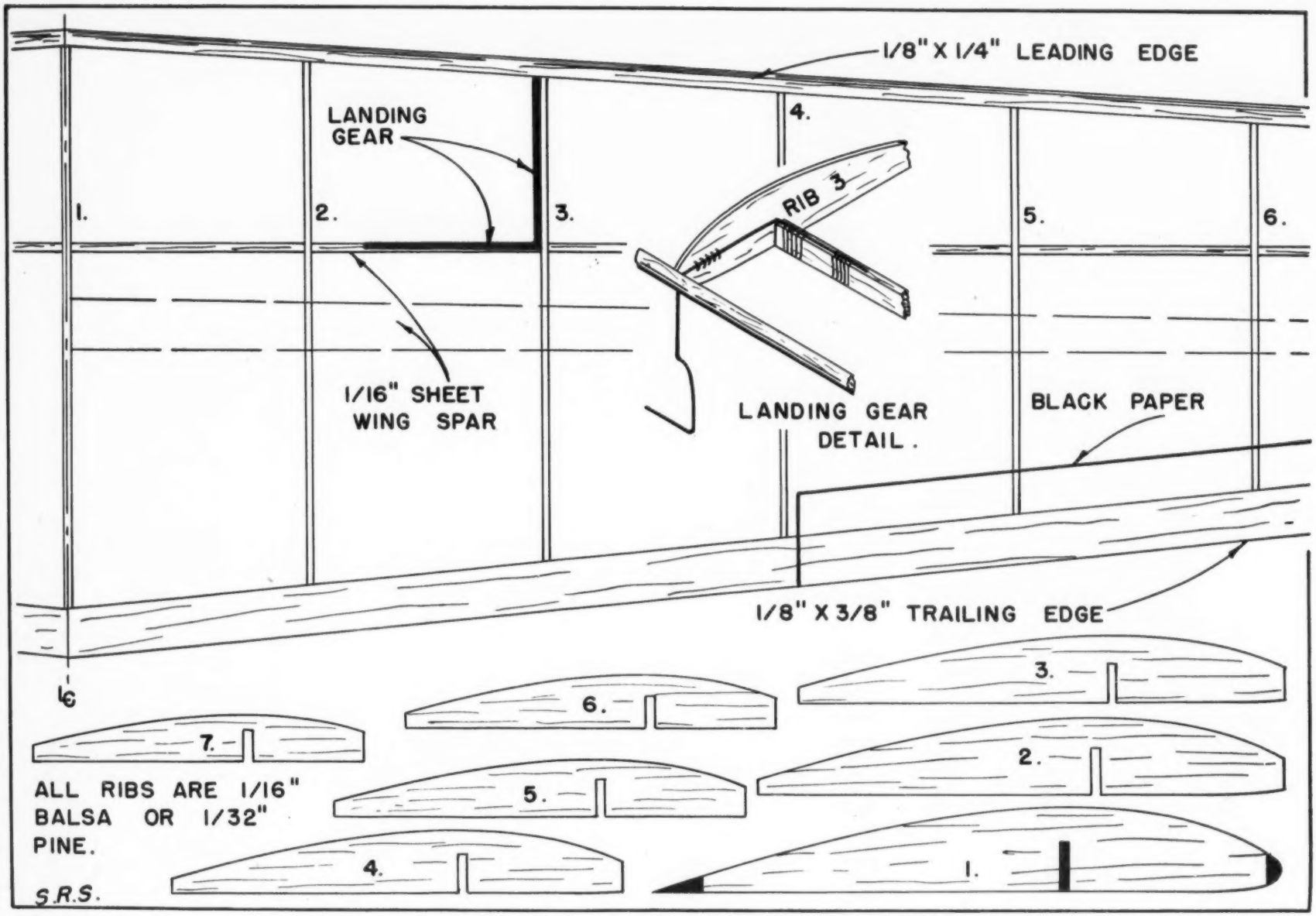
FUSELAGE: Begin construction by making the keel pieces. Trace top and bottom outlines of the side view to get the correct shape; the bottom keel is a continuous piece extending from nose to tail, and the top keel is two separate pieces. Average depth of the keels is about 3/16"; they are cut from 1/8" sheet balsa. Bulkheads are shown full size on the plan and they are cut from 1/16" sheet except bulkheads A and B which are 1/8" sheet balsa. Two of each are required. You will notice that the bulkheads are marked where the stringers run; they are notched during the actual construction to insure accuracy. Cut the keel notches however and merely mark the other positions.

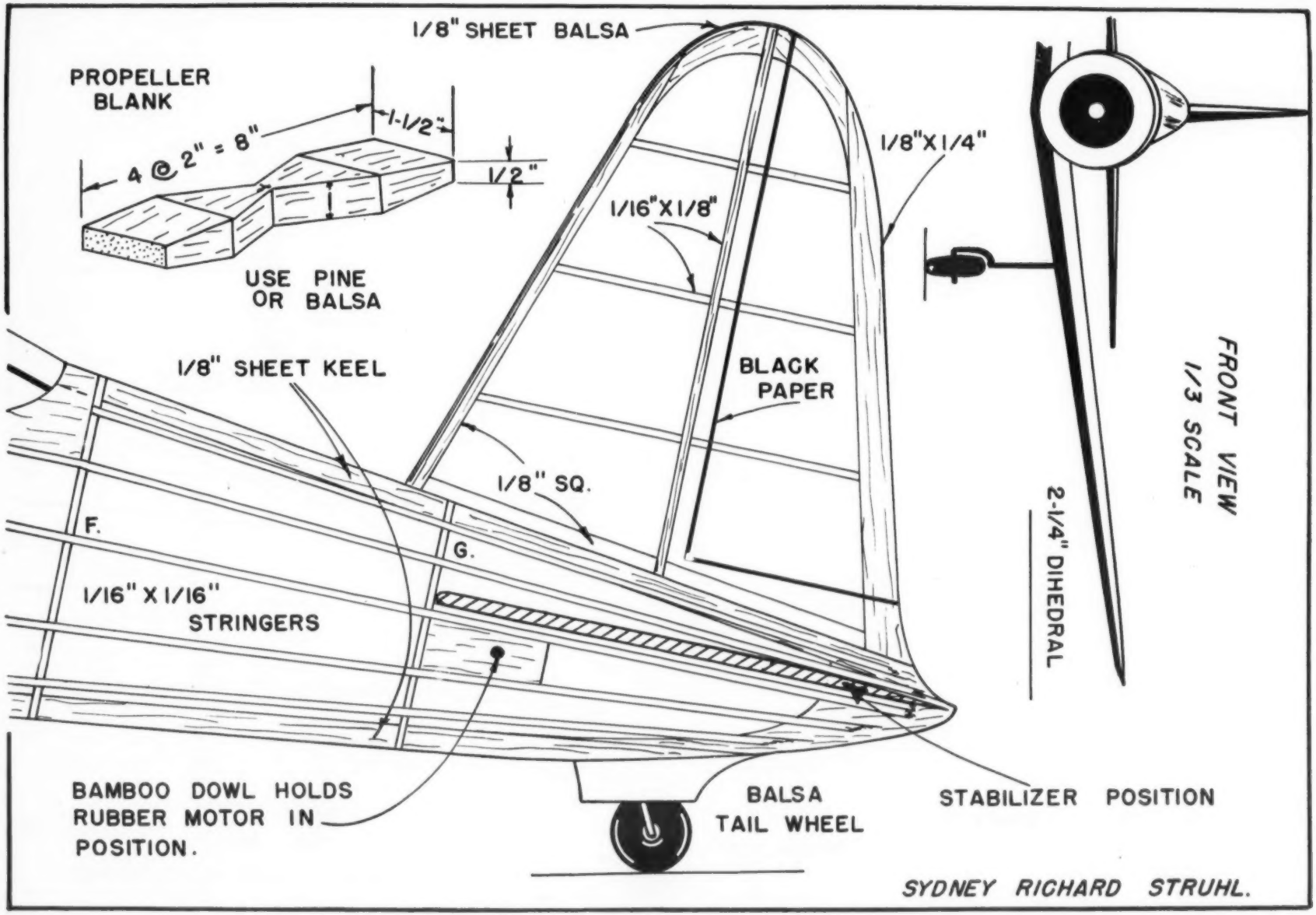
Pin the keel pieces into position over the plan and begin actual fuselage assembly. Temporarily cement a piece of 1/8" x 3/16" balsa between the top keels to join them at the opening created by the cockpit. Cement half the bulkheads to their respective positions and when dry remove from the plan and attach the remaining ones to the other side. Align the bulkheads accurately so they are exactly

(Continued on page 41)

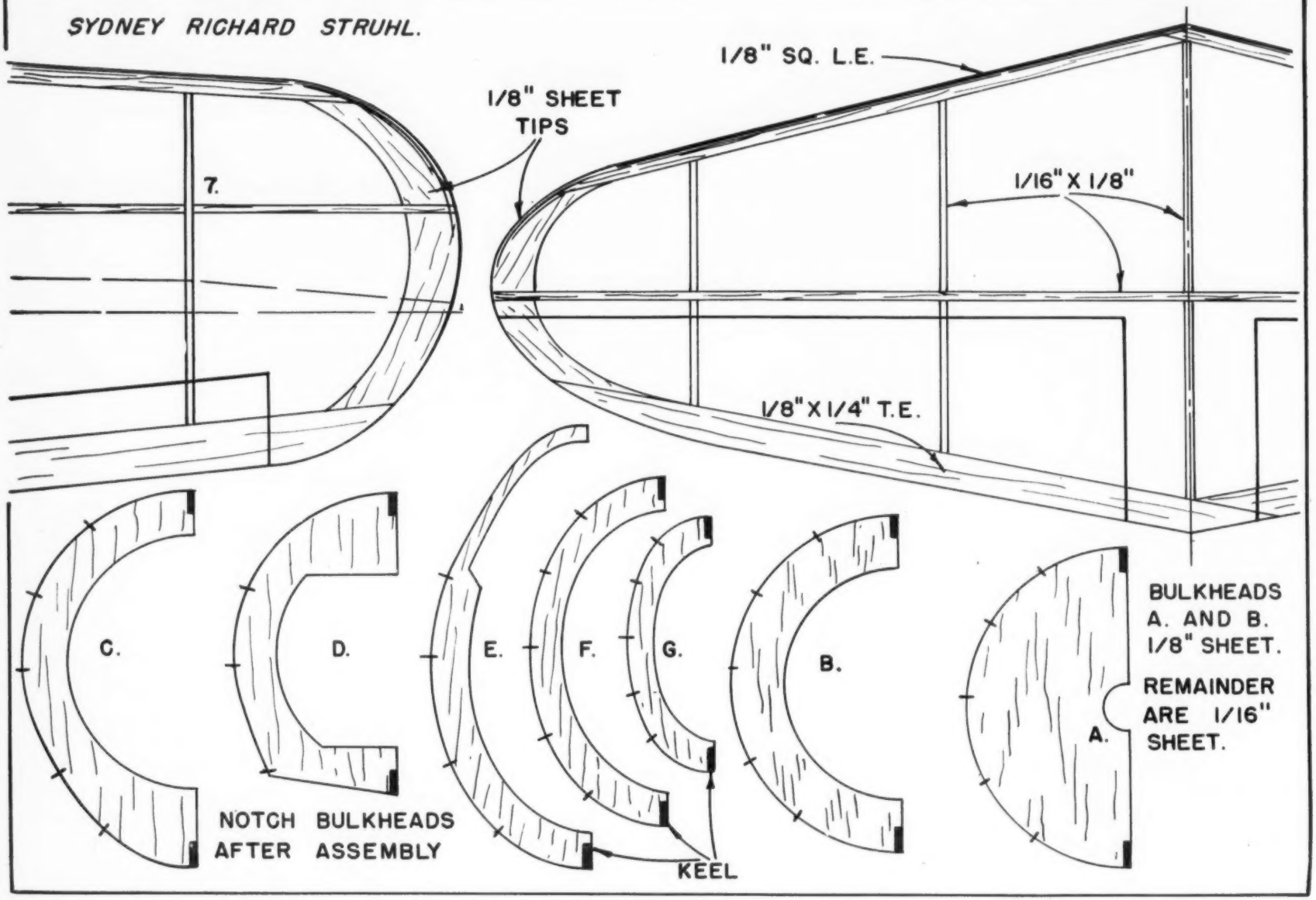
Above **The completed model with efficient propeller is a fine flier.** *Below* **with "greenhouse," single strut landing gear and decorations it looks just like the full scale plane**

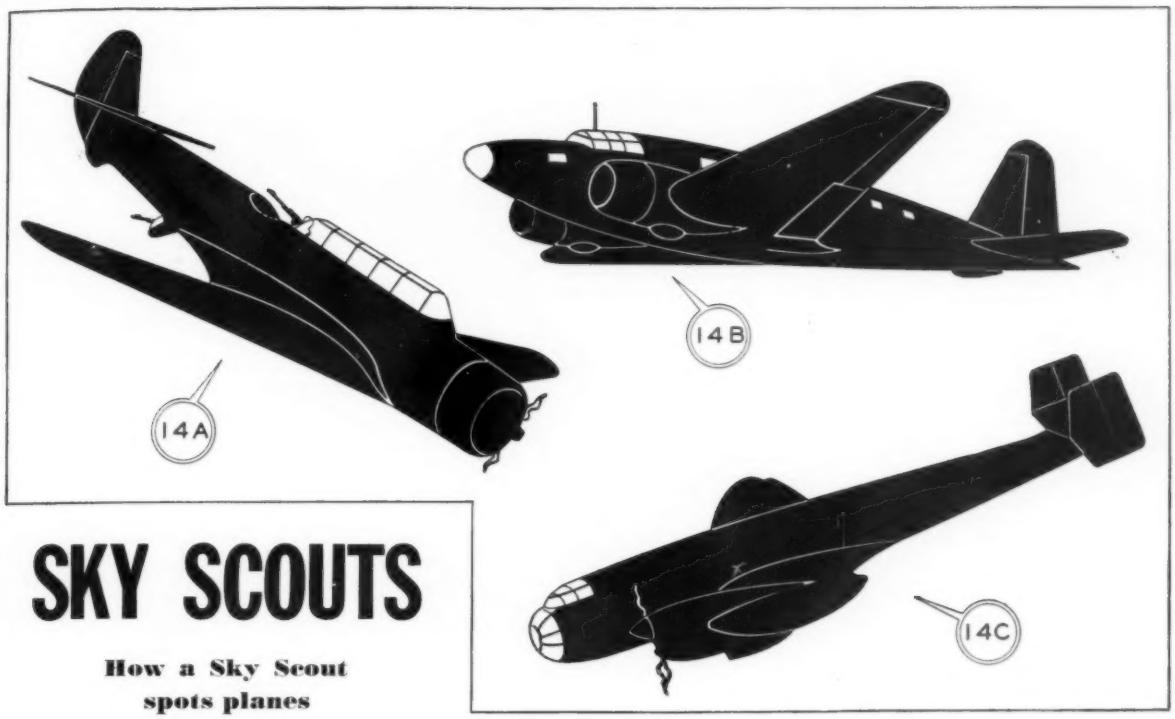



1/8" X 1/4" LEADING EDGE
LANDING GEAR
1.
2.
3.
4.
5.
6.
RIB 3
1/16" SHEET WING SPAR
LANDING GEAR DETAIL.
BLACK PAPER
1/8" X 3/8" TRAILING EDGE
7.
6.
3.
5.
2.
4.
1.
ALL RIBS ARE 1/16" BALSA OR 1/32" PINE.
S.R.S.


1/8" SHEET BALSA
PROPELLER BLANK
1-1/2"
4 @ 2" = 8"
1/2"
USE PINE OR BALSA
1/8"X1/4"
1/16"X1/8"
1/8" SHEET KEEL
BLACK PAPER
1/8" SQ.
F.
G.
1/16" X 1/16" STRINGERS
2-1/4" DIHEDRAL
FRONT VIEW 1/3 SCALE
BAMBOO DOWL HOLDS RUBBER MOTOR IN POSITION.
BALSA TAIL WHEEL
STABILIZER POSITION
SYDNEY RICHARD STRUHL.

SYDNEY RICHARD STRUHL.





SKY SCOUTS

How a Sky Scout spots planes

YOU are now going to "take a turn" at spotting planes for Uncle Sam at some imaginative remote spotter's post; so fold back the magazine and set it up on the table under your lamp so the light shines on the above silhouettes and they stand out in clear view. Then settle back in your comfortable chair at a distance of about five ft., letting your imagination carry you to some remote look-out post; perhaps on the top of some hill or mountain; in the city it might be a tall building.

Anyway you are now scanning the skies for enemy aircraft. Suddenly "out of the blue" appears a ship on the left—14A on the diagram. It is moving at high speed so you must make a mental record of its distinctive features without hesitation. It is obviously a single motor ship, as no engine nacelles appear on the wings and apparently the nose is blunt, inferring a cowl engine. A "greenhouse" of some length is evident on top of the fuselage and your eye catches a glimpse of some protrusions from its rear, also one from the lower part of the fuselage to the rear of the wing. The ship is flying quite fast, evidently its speed is high for its size.

You notice these at one quick glance because time is short before the ship noses into a cloudbank; however this momentary impression is sufficient to tell you the mission of this plane. Hurriedly you write down these distinctive features and check them mentally or with your chart of various plane types.

First, is it a pursuit ship? No, not exactly, for the long greenhouse and the protrusions from its rear of the lower part of the fuselage are not characteristic of this type. The long greenhouse indicates a crew of 2 or 3. It might be an observation plane but the protrusions appear to be guns, usually not carried on observation ships. Guns are more indicative of a fighter, probably a 2-seater fighter. Now the picture becomes quite clear, for you know that the mission of a 2-seater fighter is either light bombing or ground strafing. Such ships are seldom but sometimes used for observation. If the plane is flying over a combat area you will suspect that it is on a ground strafing expedition; if over industrial areas, it is probably on a light bombing mission, scouting out vital points, lines of communication or industrial production.

The final and vital decision is whether it is friend or enemy. This is a more difficult task, for friendly ships of any one type have the same basic characteristics as the enemy, the only difference being in details of design, outline of fuselage, wing, fin or stabilizer. To determine the last question if you are not thoroughly familiar with enemy types, you turn to some descriptive chart or booklet.

Having glimpsed the ship only momentarily you may not have formed a mental picture of many of its distinctive features unless you are an "old hand" at the game. Nevertheless you turn the pages of your book or examine your chart, searching for a silhouette similar to the image in your mind. Finally you come to it, or if reference to chart or book is not necessary, you note that the body is similar to a Vultee, the wings are sharply tapered, fin is quite rounded, wings give an impression of German origin, rudder or fin appear similar to the U.S. Navy Curtiss SOC types, fuselage to the rear of the wing has a characteristic curve of the Douglas dive bombers.

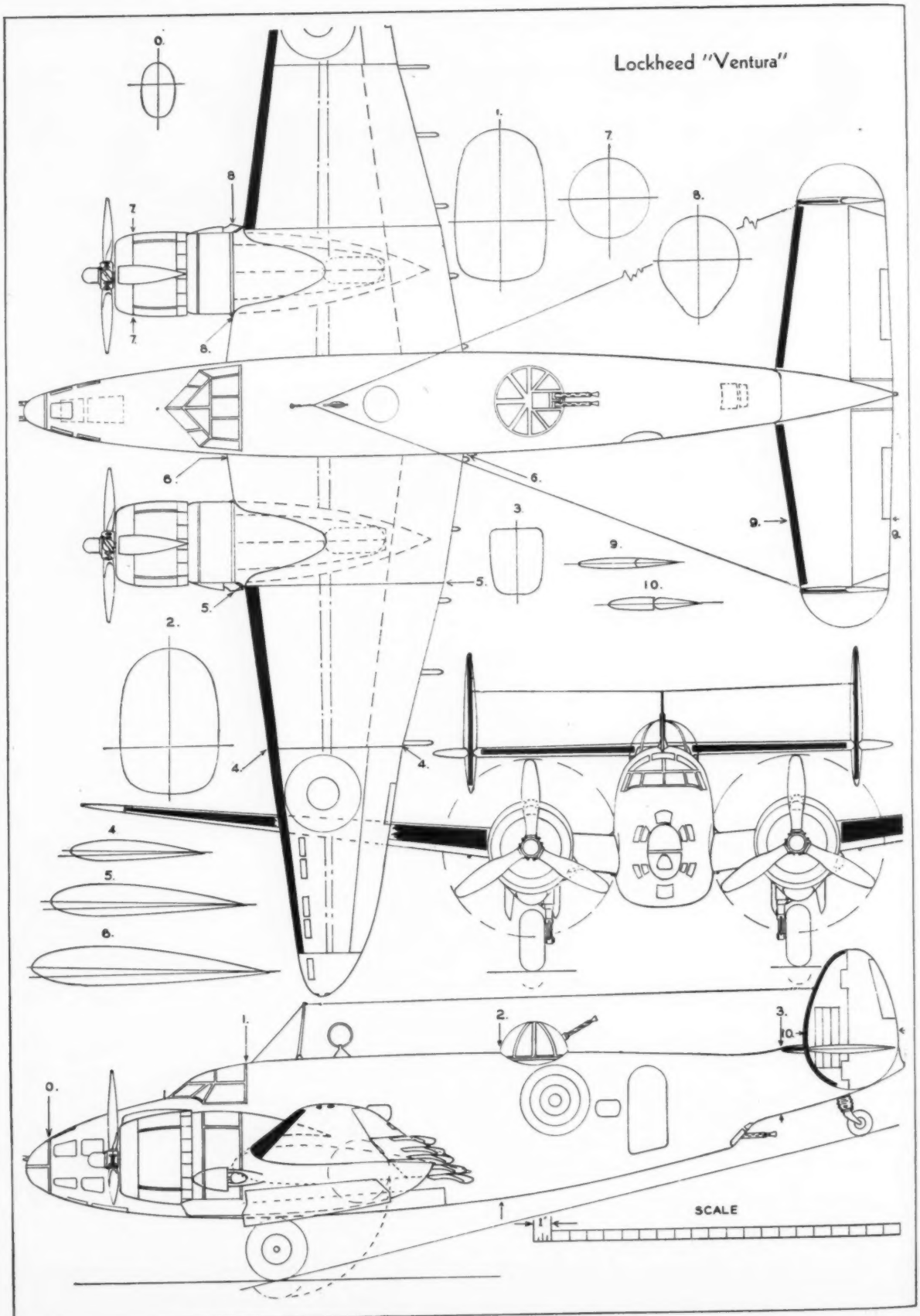
Apparently this ship has features of many types. This suggests immediately its origin—Japanese—because the Japanese have been noted for using distinctive features of many types and nationalities of planes and incorporating them in their designs. Most of their ships are conglomerate, so you look through the Japanese section and suddenly you recognize the silhouette on the page. It is the Showa SB 99. Why, certainly, now you see the similarity: this is a copy of the U.S. Vultee, a fighter bomber.

You no sooner have completed your identification than another plane appears —upper right-hand silhouette, 14B. Glancing at it you follow the same mental process. Obviously there is no engine in the nose but you observe 2 nacelles mounted on the wing. Apparently it is a bomber. You are not quite sure because the fuselage has smooth unbroken lines with no visible guns. At the nose there appears, however, to be a nose window or gun compartment.

Examination of other parts of the ship give no indication of defensive armament. This suggests a transport, possibly carrying parachute troops. In either case, whether bomber or parachute plane, it is a dangerous weapon, if an enemy. So, quickly you glance at the design details. The fuselage looks like a Lockheed, so do the wings and engine nacelles; but Lockheeds have twin rudders and this has one single fin, resembling a Douglas.

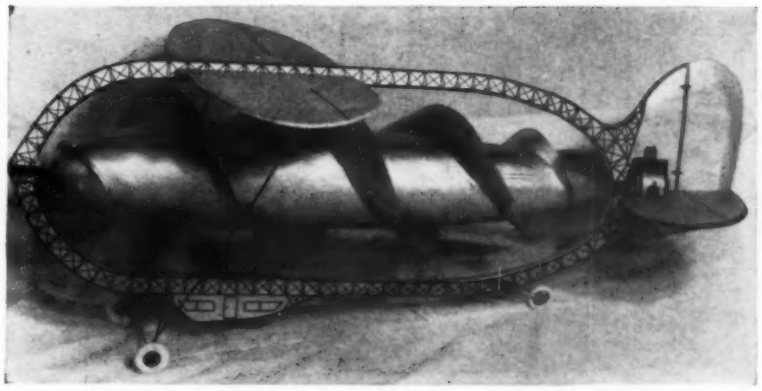
Close observation shows that the assembled details follow no requirements of American planes. Again this suggests Japanese—and this is correct. Looking through the list of silhouettes of enemy ships you recognize the Mitsubishi MC 20—an Army parachute transport, given the Army designation Y 98.

(Continued on page 46)


Lockheed "Ventura"
SCALE
1"

AVIATION FORUM

Analysis and discussion of ideas, and answers to perplexing problems submitted by readers



The "Aerozep", combination airplane and gas-filled airship

LAST month the Forum included a discussion of design features of a particular plane. We find however that our readers are interested in discussions of every phase of aviation; models, contests, rules, construction, etc. Therefore in the future this Forum will comment on features of interest in various branches of aviation. Readers are requested to send in their ideas for new types of planes, new construction, suggestions for rules, model flying, or questions.

This month a very unusual feature, in the form of an "Aerozep," comes to light and it illustrates how far imagination can wander from basic principles of design. In some instances this is an excellent procedure and is similar to a prospector wandering out among the hills for hidden gold; however the prospector must be able to distinguish real gold from hidden gold. In other words, he must know his job and in this experience and thought is a great modeler, gradually leading ideas into logical channels and away from the impractical and fantastic.

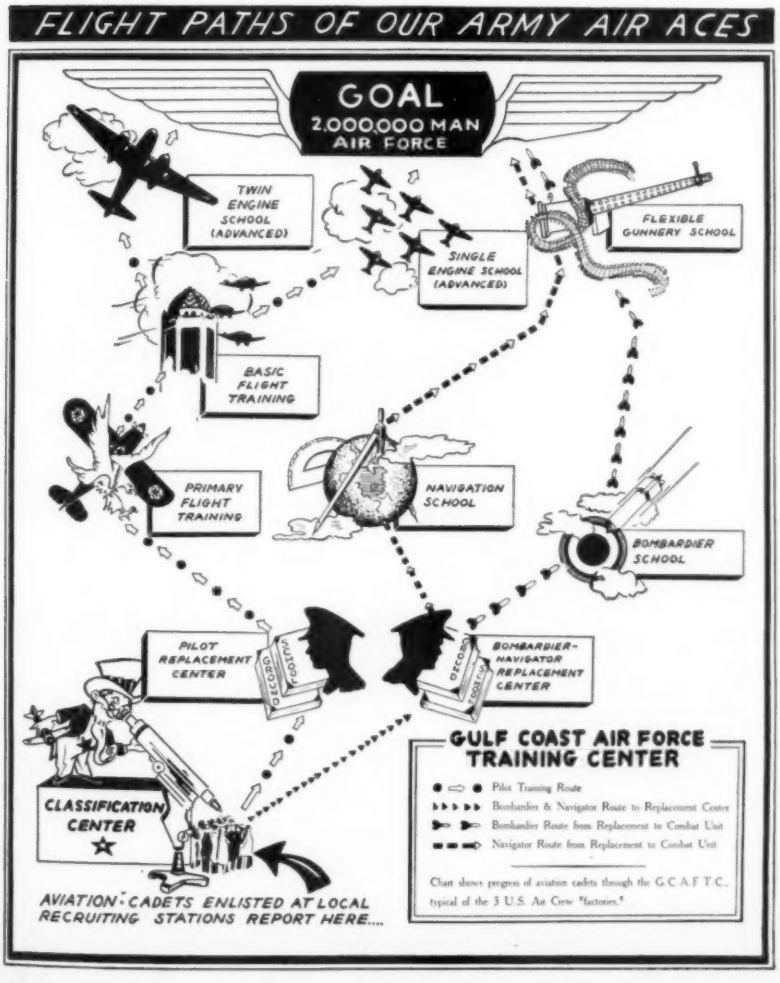
The object of discussion this month leans to the latter, a picture of which is shown here. It is a case of phenomenon, interesting in aeronautics but indicating a lack of fundamental knowledge, due to applying an excellent aerodynamic principle "the hard way." The only error is in its application.

It is a combination of zeppelin and airplane. The jinx appears when an attempt is made to put this into practical form. In the picture a plane is illustrated with the fuselage formed by a hollow elongated ring. Within this ring is a streamline rotor which is to be filled with helium for static lift, and on whose exterior is fastened a continuous spiral surface. This central core mounting the spiral is rotated at high speed and thereby screws itself forward through the air, performing the same function as the propeller.

The principle of using the spiral for propulsion is old, this adaptation is comparatively new though fantastic. The structure shown would be well adapted to propulsion through a highly viscous liquid rather than air, for only in that way could this type of "propeller" operate efficiently. In this form it serves the purpose of producing great propulsive area with small diameter, neglecting however the fact that the forward or convex surface of a propeller blade gives most of the thrust—in the same manner that the upper surface of a wing gives most lift.

In such a device propulsion would result from the push on the back of the blade rather than suction on the front. Because of this it is doubtful that sufficient thrust can be developed for propulsion, and surely power efficiency would be little; that is, for the thrust developed

(Continued on page 48)


FLIGHT PATHS OF OUR ARMY AIR ACES
GOAL
2,000,000 MAN AIR FORCE
TWIN ENGINE SCHOOL (ADVANCED)
SINGLE ENGINE SCHOOL (ADVANCED)
FLEXIBLE GUNNERY SCHOOL
BASIC FLIGHT TRAINING
PRIMARY FLIGHT TRAINING
NAVIGATION SCHOOL
BOMBARDIER SCHOOL
PILOT REPLACEMENT CENTER
BOMBARDIER-NAVIGATOR REPLACEMENT CENTER
CLASSIFICATION CENTER
AVIATION CADETS ENLISTED AT LOCAL RECRUITING STATIONS REPORT HERE....
GULF COAST AIR FORCE TRAINING CENTER
Pilot Training Route
Bombardier & Navigator Route to Replacement Center
Bombardier Route from Replacement to Combat Unit
Navigator Route from Replacement to Combat Unit
Chart shows progress of aviation cadets through the G.C.A.F.T.C. typical of the 3 U.S. Air Crew "factories."

The step-by-step progtess of aviation cadets through the Gulf Coast Air Force Training Center is depicted by this flow chart. Cadets selected at the classification center for pilot training go to pilot replacement center (4½ weeks) primary, basic and advanced schools (9 weeks each) and receive their wings and commissions. Bombardiers and navigators, specially selected, spend 9 weeks in their replacement center. Navigators graduate after 15 weeks, bombardiers in 12 weeks. Both go by the gunnery school for 5 weeks course there. Bulk of gunnery students now are enlisted men (not aviation cadets) who will become combat gunners. (Internat. Photo)

U. S. Army's LIGHTNING

LOCKHEED P-38

Build and fly these fine Joe Ott Models and *Enjoy the Thrill of a Lifetime!*

OTT-O-FORMERS ARE FIVE WAYS BETTER

1. Ready-Cut Ott-O-Formers. 2. Ready-Cut Wing Ribs. 3. Ready-Cut Nose Block Parts. 4. Ready-Cut Propellers. 5. Long, Straight smooth strips.

De Luxe Model—Nearly Four Foot Wing Span

Here is a Joe Ott model of the Army's famous twin-motor pursuit plane that is raising havoc with the enemy in so many theatres of war. The "Lightning" has a cruising and top speed that out-does them all just as this Ott-O-Former model is tops in the model field. Get this big 45 inch kit at your dealer. Complete Kit..... **$1.39**

If no Ott-O-Former dealer in your neighborhood send $1.50 (stamps or money order) to address below for prepaid delivery to your home.

The R. A. F.'s SPITFIRE

TWO-FISTED FIGHTER—45 INCH MODEL

The Spitfire is considered the fastest and most easily maneuverable fighter plane ever to be built in Europe and the British people are justly proud of its fine war record. The Joe Ott model of this fine ship built the easy way with simplified Ott-O-Former construction is a beauty and one you'll be proud to build and fly. Big 45 inch kit at your dealer..... $1.31

If no Ott-O-Former dealer in your neighborhood mail your order to address below. Enclose $1.50 (stamps or money order) for prepaid delivery to your home

Superior Quality **CEMENT** and **DOPE**

When you need extra Cement or Dope ask for JOE OTT brand.

CEMENT
Large Tube
5c
Extra Large
10c
DOPE
All Colors
10c

Brewster
38 Inc
Consolida
22 Inc
Curtiss Pu
22 Inc

JOE OTT MANUFACTURI

Build and Fly these
Big 45 Inch American and British

FIGHTER MODELS

Get Genuine **Joe Ott KITS**

WITH OTT-O-FORMERS

The Original Simplified Construction Method - Saves One-Half Building Time

Your Dealer HAS THESE THIRTY THRILLING JOE OTT KITS *with Ott-O-Formers*

Airabonita
22 Inch Wing Span Kit.....15c

Airacobra
32 Inch Wing Span Kit.....50c

Boeing Flying Fortress
32 Inch Wing Span Kit.....50c

Brewster Dive Bomber
38 Inch Wing Span Kit.....75c

Consolidated Catalina
22 Inch Wing Span Kit.....15c

Curtiss Pursuit
22 Inch Wing Span Kit.....15c
27 Inch Wing Span Kit.....29c
40 Inch Wing Span Kit....$1.00

Douglass Dauntless
27 Inch Wing Span Kit.....29c

Grumman
27 Inch Wing Span Kit.....29c
32 Inch Wing Span Kit.....50c
40 Inch Wing Span Kit....$1.00
("Avenger" Torpedo Bomber)

Hurricane
22 Inch Wing Span Kit.....15c

Lockheed Lightning
32 Inch Wing Span Kit.....50c
45 Inch Wing Span Kit....$1.39

Martin Maryland
38 Inch Wing Span Kit.....75c

Messerschmitt
22 Inch Wing Span Kit.....15c

Mustang
27 Inch Wing Span Kit.....29c
40 Inch Wing Span Kit....$1.00

North American B-25
22 Inch Wing Span Kit.....15c

Spitfire
22 Inch Wing Span Kit.....15c
27 Inch Wing Span Kit.....29c
32 Inch Wing Span Kit.....50c
45 Inch Wing Span Kit....$1.39

Stuka Dive Bomber
22 Inch Wing Span Kit.....15c
32 Inch Wing Span Kit.....50c

Vought Sikorsky
22 Inch Wing Span Kit.....15c
32 Inch Wing Span Kit.....50c
38 Inch Wing Span Kit.....75c
27 Inch Wing Span Kit.....29c
("Kingfisher")

Vultee Vengeance
40 Inch Wing Span Kit....$1.00

Two Series, Each **25c**

IDENTIFY THE WAR PLANES

It's fun and a patriotic service to build IDENTOPLANES and use them to identify the war planes. Each kit has material for 10 silhouette models. At your dealer.

Your Ott-O-Former Dealer Invites You to Come In

Go to your dealer today and see the fine line of Ott-O-Former models he has waiting for you. If there is no dealer carrying these models near you send your order to address below. Minimum order accepted $1.00. Add 25 cents for packing and postage on each order. (Postage on 45 inch kits as described 11 cents each)

RING CO. Dept. 26 *415 West Superior Street,* **CHICAGO**

10. Sherman Schultz is justly proud of this scale Grumman gas model

Air Ways

(Continued from page 21)

only a fraction of the power; at 5 degrees below zero the rubber will usually break at 3/4 winding.

Clifford Coulbert of 5540 27th NE, Seattle, is an expert scale model builder. One of his jobs is shown in picture 5, a Boeing P-26A built to half scale. The details have been carefully carried out and include a full 9-cylinder engine, full moveable cockpit details, retractable landing gear, pilot, 2 machine guns that protrude between the cylinders, and insignia. Coulbert says that this model is not as good as a Seversky P-35 he has built; the P-35 including 416 separate pieces and sporting approximately 17 coats of dope, sanded and polished to a mirror finish. However, the Boeing runs a close second. You will note there are many little details similar to the big ship; for instance, the aerial, guy wires with spanners between them, inspection hatches just to the rear of the motor, and the excellent job of decoration. Coulbert now is studying engineering at the University of Washington and builds models during his spare time. Incidentally, this is the first time we have ever heard of an engineer having spare time!

In picture 6 you see the champion of the San Diego Aeroneer's Gas Model Assn. with one of her record planes. She is Leta McAllister of 236 Garrett St., Chula Vista, Cal., who has a standing of 15 points for contest flying over a six months period. In second place is Gene Ryan; 3rd place, Eddie Hume. Obviously science does not respect sex—whoever solves her riddle will win, whether it is man or woman. While the boys are away shooting at the Japs and Jerrys the women are "making hay" with their gas models. That doesn't mean, however, that there is not still a host of expert builders active on the home front. It isn't for lack of competition that Mrs. McAllister has this high standing; she just knows her gas models.

John Reynolds of 435 N. Sycamore, Albuquerque, N.M., sends us picture 7 showing his control-line "Varsity" model powered with a .23 cu. in. motor. He says it is built mainly of sugar pine and stands up very well. At first we thought he was referring to his small mascot beneath the left wing, but Mr. Reynolds doesn't mention whether the dog is mascot, pilot or just a helper. Possibly he is a retriever, for many a gas model flier has known moments when such an animal would be very handy indeed. This is Reynold's third gas model and has made about 50 flights. For a 13-year-old young man, this is excellent!

Reynolds has found that hard woods are not really as difficult to use as many people think and in many ways he finds them superior to balsa.

Probably the greatest thrill that a model builder can experience is flying a U-control scale model of some warplane. Picture 8 shows a scale Curtiss P-40D U-control gas model. We can understand how anyone could be thrilled with this speedy realistic ship at the end of his line. It is a 40" model powered with an Ohlsson 60 engine, constructed by Eut Tileston of 1029 Granview Ave., Boulder, Colo. Though the model isn't exceedingly fast it is very maneuverable and is painted exactly like the desert fighters. It is completely planked with balsa and very rugged. Tileston is a member of the Denver Pioneer Gas Model Club but is now attending the University of Colorado, studying aeronautical engineering.

Picture 9 is rather indistinct and it may be difficult to determine exactly what it portrays. However, it is a photo of a very unusual and interesting model, built by Donald Paige of Peru, Vt. He apologizes for the picture but tells us that the plane shown has an aspect ratio of 18, a wing of 36" in span and 2" in chord. It is equipped with ski landing gear and a one-bladed propeller. Both the wing and stabilizer are parasoled, two small vertical surfaces at the end of the stabilizer serving as rudders. He says it climbs slowly and glides better than any model of regular design, taking off from snow very realistically. Paige feels it is most interesting to explore the unbeaten paths. In building this ship he proved one important point about the planform of wings: high aspect ratio gives very high efficiency, a high rate of climb and flat glide.

Usually the only drawback to such a wing is the weight of structure required to give strength to this long narrow span. However a plane with balsa wing, as shown here, is excellent to demonstrate this theory. Build a high aspect ration wing and try it sometime—you will be amazed at the results!

In picture 10 Sherman Schultz of 288 S. Saratoga, St. Paul, Minn., holds his Grumman F3F-2 control-line gas job. He says:

"No more of this 100 plus mph stuff for me. May I put in my 'two bits' worth for these scale control-line models—they are really the thing! I cannot imagine a greater thrill in control-line flying than in taking off a real scale model, have it circle around and then come gracefully in to a beautiful landing.

"This is why I prefer a large size scale model; they look more realistic, more details can be put on and that is what I want—and you are really learning something about the 'tricks' of the plane that has been modeled.

"As for the one in the picture, the span is 5 ft. Top of the top wing is orange yellow, rest is aluminum except for a blue tail and red trim on cowl and leader stripes. It is covered with silk and Silkspan and the entire front half of the fuselage is filled in with inserts between stringers and bulkhead. This is covered with 1/32" sheet and finally with Silkspan, doped and painted."

Schultz says the structural design is his own. Power is provided by a 1/4 hp. engine.

One of the prouder cadets at Brooks Field is A/C Edward J. Onze. The reason? He has just completed a P-51 (North American Mustang) plane model that he has been working on in his few leisure moments ever since December.

In picture 11 Onze demonstrates his model to Major Kenneth B. Hawkins, Administrative Executive of the Brooks Ground School, and Major George H. Wenn, Director of the School.

Long a hobby and almost a profession with Cadet Onze, his plane models receive the most meticulous attention while they are in the making; the finished product exact in every detail. "I started building models when I was in grade school back in Olyphant, Pa., and it's been a hobby ever since then," he said. "Before entering the service I had a number of models on exhibition in Scranton, and had seriously considered going to work for some aircraft factory making models for wind tunnel experiments."

Finished and exact in every detail is Cadet Onze's P51. Constructed of solid balsa wood, with a 19-inch wing spread, some of the more realistic touches are: a hatch made of cellophane which opens up to reveal a carved-out cockpit complete with instrument panel, stick and radio; rotating propeller blades; a retractable landing gear and tail wheel; movable controls with tabs on them; ailerons which move freely; "fish-scale" exhaust tanks and wing lights. The smooth finish of the balsa fuselage shows many hours of sandpapering, with many more on a professional paint job.

Puerto Rico

From Puerto Rico we have received reports of one of the few gas model contests. It was sent to us by J. A. Carrasquillo, secretary of the 24th Model Airplane Club,

12. Hugh Byers launches his gas job with an encouraging push

Santurce, P.R. His report follows:

"The 24th Model Airplane Club held a gas model contest in February 28, 1943 with the winners as follows:

1st Place: Arturo Sarraga.

Total Time—9 min. 6 secs. with a modified "Ensign" powered by an Ohlsson "23".

2nd Place: Miguel A. Manzano.

Total Time—4 min. 26 secs. with an original design of club member, Geo. Ortiz, powered by an Ohlsson "23".

3rd Place: George Ortiz.

Total Time—3 min. 17 secs. with own design powered by a Brown engine.

"The winner's plane, in its second and last flight, disappeared out of sight with a thermal after 6:44; the model was later recovered. The 2nd place winner had the bad luck that his plane struck a telephone line in his second flight, resulting in a complete washout. And the 3rd winner, Geo. Ortiz, apparently had trouble with his motor after his first flight.

"This is the second gas model contest celebrated in Puerto Rico and our club is going to continue with them as long as possible."

Ohio

We hear from Mr. W. Gin of 705 Chillicothe St., Portsmouth. Mr. Gin is secretary of the Portsmouth Sky Snoopers Club. Picture 12 shows Hugh Buyers in action. It has always been the custom to launch a model horizontally and release both hands simultaneously; however in the picture Byers is evidently attempting to give that "last minute push" that, erroneously, many model builders believe improves the flight. On the contrary, it often disturbs the fight balance of the ship at the beginning of its flight to such an extent that a stall or some other disturbing maneuver results. At any rate, it is a real action picture and from appearances the model is started on a fast steep climb.

Mr. Gin says that due to gasoline rationing club activities have been curtailed considerably but "we manage to struggle along." We have a dandy field about 12 miles from here where we do our flying. Our club is a small one, meeting at the local YMCA on Tuesday nights. An excellent leader advises the boys in their problems."

Oregon

Mr. N. E. Walker of Portland has possibly contributed more than any other single modeler to the advancement of U-control flying. Recently he wrote to Mr. Everett N. Angus of the A.M.A. concerning rules governing such meets and made a few suggestions, borne of experience in participating in many contests on the West Coast. He said:

"Apparently the general rules and regulations for our contest on Aug. 23, 1942 were not limiting enough. Although it will probably not be necessary to restrict models to a specified wing loading for speed events, which by the way would be in reverse of those laid down for duration models, there should be some limitation that would restrict clipped wing models of almost no span that are practically flying motors, or the dropping of landing gear after taking off. We think the answer here would be to merely specify that the model must R.O.G. and at the end of its speed run must land without nosing over or touch wing tips to ground. This in itself would prevent the stimulation of unorthodox designs that would have no counterpart in full size aircraft. It would also of course add tremendously to the suspense and interest of a contest, since after a contestant made a speed run which would be the high time up to that part of the contest, it would be a matter of great interest to watch his attempt at landing in such a manner that would avoid cancelling of his timed heat. Another advantage, of course, is that the contestant himself, due to his own skill can increase his chances considerably.

11. Edward Onze demonstrates the mechanism of his N. A. P-51 to Majors of his Ground School

"In discussing the different events, we can make many suggestions that would improve a contest of this nature. Referring to the first two events, we have no remarks to make here outside of a possible addition of another racing class that would separate the motors having a displacement of more than .60 inch. There is no advantage in having an event for Class A motors, since same are very seldom used in control line flying. You will note in Rule 13 that we have allowed two different lengths of line, since we do not feel it safe to fly the high speed jobs on the shorter length. In Rule 14 we specify ½ mile run, however during the contest we had to change this rule since many of the contestants did not have fuel tanks large enough to make more than the ¼ mile. However, during our last contest in Los Angeles only one contestant out of thirty finalists failed to complete his flight, which was a full mile run. In local contests it might be alright to have a ¼ mile arrangement, but in our estimation we think the heat should be either ¼ mile or ½ mile, and the final if any should be for a full mile. This gives a chance to the painstaking type of contestant, who gets a dependable flight, with the "slap-dash" type who may have a super-hot job that is good only for a few laps and then leans out or slows down for some other reason.

"Of course, in laying our plans for any National competition, the regulations shown for maintaining a minimum altitude might have to be altered. We have many methods for regulating this and will be glad to supply them if you so desire.

"Event No. 3—Precision Landings, Event No. 4—Slow Speed Flight, and Event No. 6—Novelty Acrobatics. These should not be separate events. We found it takes too long to run off a contest if these are all considered as being made in separate flights. In other words, these events could be listed as they are, but all racing contestants during any of their heats or finals would be eligible for first place in "Slow Speed Flight" or at the finish of his timed run he could go into his "Novelty Acrobatics," providing his fuel supply was large enough to go through a routine. Same contestant of course should be eligible for Event No. 3 at the end of his flight. Such a setup makes for extreme interest, since it relieves the monotony of straight racing and the contestant knows that he is eligible for four prizes, rather than just one.

"The rest of the events on the program are, with the exception of 'remote control,' possibly too involved for the average contest at the present time. We also appreciate that these rules were laid out with spectator interest as a deciding factor, which as it turned out was not important at all.

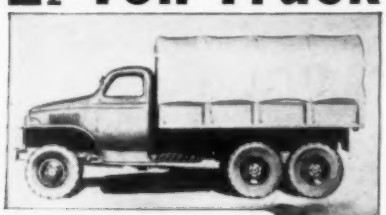
"If any of these suggestions are helpful you are welcome to them, and if we can be of any further assistance in answering questions, we shall be happy to do so. We have a large supply of these posters which we shall be glad to send to anyone making inquiry to you for a set of regulations for running a contest. If so desired, we shall make up a mimeographed list of suggestions along the line of those discussed in this letter.

"As stated previously in this letter, we

(Continued on page 61)

PROMPT SHIPMENT FROM STOCK

2½ Ton Truck



Kit $1.50 Order Now. Add 10c for Postage

AN72—Austin-Craft's faithful, authentic model all-purpose official United States Army Truck. "Ten wheeler" used for transporting both supplies and troops. Kit contains complete parts, pre-cut and ready for assembly. Get in your order today and start your motorized division.

BUILD THIS U. S. ARMY "JEEP"

AN22—The busiest car on the battle front; a compact model with movable wheels and windshield, makes up into a super-detailed replica. Kit includes cut-to-size parts, necessary hdw., full size plans and instructions. 60c Complete kit..... By mail 70c

CLEVELAND MODELS READY FOR IMMEDIATE DELIVERY

AN57—DAUNTLESS the tough bomber; won spurs at Midway; 30⅛" span....$3.50

AN65—Messerschmitt.. $3.00
AN70—British Spitfire.. 3.00

AN60—LOCKHEED LIGHTNING, famous P-38; fast as lightning; doing a big job sketched above $4.00

AN58—BREWSTER BUFFALO the peanut special; span 24½"; complete master kit sketched above.....$3.00

AN56—LOCKHEED HUDSON our powerful bomber; big 49¾" span; complete kit sketched above $7.50

AN59—REPUBLIC THUNDERBOLT—a flying battleship; span 30¾"; complete kit sketched above.....$4.00

AN55—JUNKERS STUKA—span 34"; complete kit.....$3.50

AN61—"Aircobra" $3.00
AN62—Curtiss P-40.... 3.00
AN63—N.M. Mustang .. 3.00
AN64—V. S. Corsair.... 3.50

AN38—SUPER CONDOR, newly designed 7-ft. soaring glider; soars for hours; largest plane in the world for $1.00

X-ACTO KNIVES

With Blade 50c

AN33—Sharp "as a razor" X-Acto knives. Make cutting easier, faster, truer. Blades instantly changeable.
AN34—X-Acto Combination Set includes 2 knives 12 blades $2.00
AN41-X-Acto Knife Chest. $3.50

CATALOG BARGAIN

AN11—Cleveland, Berkeley, Hawk, Ideal and Burkhard—five of em, all for one price.....25c
Enclose 10c postage.

AN12—Fischer, Ideal and Marine all for...25c
Enclose 5c postage.

Camouflage, $1

7 bottles of varied camouflage colors with instruction booklet. Plus 25c for postage.

CHAMPION SPARK PLUGS, full stock; all sizes, each 50c

SOLID MODELS
Immediate Delivery

AN66—CURTISS P-40; deluxe model; 9½" span. 75c
AN67—GRUMMAN WILDCAT; deluxe model; 9½" span 75c
AN68—LOCKHEED P-38; 11" wing span; complete..... 50c
AN71—WRIGHT - SIKORSKY F4U1; 10" wing span; complete 50c
AN69—BREWSTER BERMUDA; 11" span; complete 50c
AN27—SUPERMARINE SPITFIRE; complete 50c
AN30 — BELL AIRACOBRA; P-39; complete 50c
AN31—MESSER-SCHMITT, 109-F; complete 50c
AN40—JAP ZERO; ¼" scale; sugar maple 35c
AN81—SINBAD the SAILOR; 50" span; $1 plus 25c postage

Have You Any USED MOTORS?
We'll gladly give you a fair price for your used motors. Write details immediately.

ORDER BY NUMBER
Postage Prepaid on Orders of $1.50 and more!

CORR'S
Nation's Hobby Supply for Over Half a Century
812 9th Street, N.W.
Washington, D. C.

Skywriter's Library

(Continued from page 16)

AIRCRAFT ENGINE TROUBLE SHOOTING CHART, by Andrew Wallace (Norman W. Henley Publishing Co., New York City), 1 large sheet. $0.75.

This is a large chart suitable for tacking on the wall of a hangar, containing a complete analysis of engine difficulties and their corrections. Andrew Wallace is a Master Mechanic and is Crew Chief for Eastern Air Lines, Inc. The chart is applicable to all types of engines and is useful for home study prior to field work.

METEOROLOGY, by W. J. D. Allan and William Alexander (Chemical Publishing Co., Brooklyn, New York), 110 pages. $1.50.

This useful little volume has been prepared by two Royal Air Force ground school instructors as a reference work for students in the R.A.F. studying for examinations. It has entirely eliminated the long, dry discourses on the subject and has pared the problem down to essential facts concerning weather. It is generously illustrated by clear, ink drawings and tables and serves as a ready, concise reference.

STRATEGIC MATERIALS AND NATIONAL STRENGTH, by Harry N. Holmes (The Macmillan Company, New York City), 106 pages. $1.75.

This compact little book, written by the President of the American Chemical Society, answers quite clearly the question of just what materials are actually of strategic importance to a world at war or peace. Many elements are described which, to the layman, have always seemed unimportant but which are actually vitally necessary to industry. Sources of these materials are clearly stated and shown on maps and the present war takes on a new meaning with a clear outline of the aims of the enemy and the United Nations.

STRATEGY AT SINGAPORE, by Eugene H. Miller (The Macmillan Company, New York City, 145 pages. $2.50.

This volume covers the vital period between 1922 and 1942 which saw the conception, construction, equipment and destruction of supposedly indestructible Singapore, Great Britain's Far Eastern bastion. The complete background, political, military and civil, of this vital stronghold is clearly and completely given and the story is carried through its unconditional surrender to the Japanese on February 15, 1942.

ALASKA UNDER ARMS, by Jean Potter (The Macmillan Company, New York City), 200 pages. $2.00.

The author of this book is a member of the research staff of "Fortune" magazine and it was under their auspices that she undertook the huge assignment of reporting on Alaska, a job she has done well. The book was written prior to the Japanese attack on the Aleutians, actually being finished in July of 1942, and it tells the complete story of the metamorphosis of the vast, frigid, mysterious possession which we purchased for salmon and which now means aerial strategic might to us. Miss Potter interviews everyone who is anyone in Alaska and presents a complete background to modern Pacific aerial thinking.

AIR NAVIGATION, by a panel of experts under the general editorship of E. Molloy (Chemical Publishing Co., Brooklyn, N.Y.). In 2 volumes; Vol. I: 128 pages; Vol. II: 132 pages, $2.50 per volume.

This is another in the famous "Aeroplane Maintenance and Operation Series" which were prepared in England but have been made available to students and servicemen in this country by the Chemical Publishing Company. Volume I of this book deals principally with general navigational problems including dead reckoning, use of charts and maps, astronomical and radio navigation and study questions and answers for Air Navigator's Licenses. Volume II continues the study in more detail dealing with compasses, calculators, meters, directional radio equipment and various navigational devices and equipment. The books are profusely illustrated and particularly well organized.

AERO ENGINE PRACTICE. Compiled by a panel of experts under the general editorship of E. Molloy (Chemical Publishing Co., Brooklyn, New York), 132 pages. $2.50.

Another in the "Aeroplane Maintenance and Operation Series," this volume is a highly practical approach to the engine service problem and includes the license requirements for ground engineers, various types of engines, engine installations and their services, tracing of engine faults and the procedure for top overhaul of an engine. Certain accessories are covered, particularly starter troubles and their remedies.

AVIATION INSTRUMENT MANUAL. Reprinted by permission of the Controller of His Brittanic Majesty's Stationery Office (Chemical Publishing Co., Brooklyn, New York), 396 pages. $5.00.

This is a very thorough treatment of aviation instruments including their theory of operation, use, capabilities and limitations and a very thorough analysis of service problems and remedies. Every aviation instrument conceivable, used either in an airplane or on the ground for testing various features of an airplane, is authoritively covered and very completely analyzed from the maintenance point of view.

METEOROLOGY FOR SHIP AND AIRCRAFT OPERATION, by Peter Kraght (Cornell Maritime Press), 373 pages. 155 illustrations by the author. $3.00.

This volume, in a very convenient, handy size, is a very useful approach to the problem of weather and is quite profusely illustrated by Mr. Kraght. The book outlines basic facts about the air and gives complete information on vertical winds, horizontal winds and what these two types mean to the accompanying weather. Fog and other low clouds are

FLYING WARPLANES
95¢
Names
that are making
AVIATION HISTORY...
CORSAIR, WILDCAT, SKYROCKET, LIGHTNING, SPITFIRE . . . these are names that are writing history in the skies . . . .and all, plus many more, are among the 95c Megow Flying Models that every model builder wants today!
With 30-inch wingspan, they are impressive in size, fascinating in design . . . and boy! the way they fly! Easy to build, too . . . with Megow plans that picture every detail.
Build a few of these Megow Warplanes now—develop your skill with tools and learn more about aviation, while you familiarize yourself with the air fighters of the great warring nations. See them at your dealer's, or write direct to us.
Megow
PHILADELPHIA, PA.

Easier!
F-A-S-T-E-R!
MORE ACCURATE
THOUSANDS OF CLEVER USERS SAY THIS OF the
X-acto
EVERKEEN KNIFE
RE-blade to RE-sharpen

Everything PLUS... that's what these revolutionary knives have! New hand-comfort — new "never-before" keenness. Eight instantly interchangeable blades make two models (Nos. 1 and 2) "custom built" for any whittling or carving job.

LET'S TAKE X-ACTO APART—SEE!

Just four parts — the solid handle, the hollow sleeve, the split collet, the world's keenest blades. SLEEVE: ¼ turn clockwise releases blade. Unscrew sleeve, slip off and see split collet, which grips blade, like lathe collets grip work.

HANDLE COLLET BLADE

Collet taper shows why only ¼ turn of sleeve loosens or tightens blade. Fast? You'll say so!

Get your X-acto today..at local hobby shop, hardware or department store or order direct!

No. 1 X-ACTO knife for light, delicate work, complete with one blade. 50c. With 5 extra assorted blades. $1.00 •

No. 2 X-ACTO knife for heavy carving — Complete with one blade, 50c • With 5 extra assorted blades, $1.00. • No. 62 Double Set handles 12 blades, $2.00 • No. 82 Fitted wooden chest 3 handles and 12 blades, $3.50.

No. 62

No. 82

GET THE FREE BOOK THAT TELLS "HOW" to build Model Planes prepared by experts, profusely illustrated, simple easy-to-follow instructions. Build solid models for Army and Navy spotter planes. Send 5c to cover handling, postage, etc.

REFILL BLADES KEENER THAN RAZORS ONLY 50c THE PACKET OF 5 • MAKES 2 X-ACTOS DO THE WORK OF 8

Buy from your local Hobby Shop, Hardware or Dept. Store or order direct.

X-ACTO CRESCENT PRODUCTS Co.
440 FOURTH AVE.
NEW YORK, N. Y.

X-acto EVERKEEN knife
RE-blade to RE-sharpen
No 1 No 2

treated and extremely useful charts and tables are included in the appendix.

AIRCRAFT BLUEPRINTS AND HOW TO READ THEM, by Carl Norcross (McGraw-Hill Book Company, New York City), 99 pages.

This book approaches the subject from the practical standpoint with studies taken from actual aircraft company blueprints of Douglas, Lockheed, Grumman, Vought-Sikorsky, etc. Each blueprint is analyzed and questions and answers given covering various points brought out by the drawings, what the engineer meant to convey and the procedure to be followed by the reader in his fabrication of the part. The subject is covered quite thoroughly and the volume is complete with useful tables, definitions of terms and signs in the appendix. It is a large-size book with the material covered in a brief, concise manner.

RENDEZVOUS, by Alec Hudson (The Macmillan Company, New York City), 94 pages. $1.50.

This is a collection of three popular fiction stories: Rendezvous, a story of a periled American outpost, too far away for plane action, too risky for a fleet action but just right for a successful submarine action. Up Periscope, a story on the Sino-Japanese war in which a sub commander is offered $1,000 a month and $50,000 for each Japanese ship he sinks; North of Terschelling, a story after Dunkirk when the coast of Holland was alive with ships of all nations and the "Searover's" orders were to sink anything on sight—until it met another submarine! Authoritive fiction told by a man who knows his subject.

THE AERO ENGINEER'S MANUAL, by P. H. Simpson (Chemical Publishing Co., Brooklyn, N. Y.), 125 pages. $2.50.

This is a "question-and-answer" type of book dealing with the subject of engine and ignition troubles and their correction. Major accessories are covered and the book is a handy volume for the trouble-shooting mechanic who must ferret out the faults of a malfunctioning aircraft powerplant.

FRONTIER BY AIR, by Alice Rogers Hager (The Macmillan Company, New York City), 243 pages. $3.50.

Mrs. Hager, outstanding woman aviation writer, was invited by the Brazilian Government to do a story on Brazilian aviation and was given the complete cooperation of the Brazilian Air Force including pilots and planes. She flew from the States to Rio de Janeiro by Pan American Airways, then boarded a Brazilian Air Force Bellance to Bello Horizonte where she turned inland and journeyed across the great Brazilian forests south of the Mato Grosso. Flying in Fairchild Clippers, Lockheed Electras and Stinson Reliants, she met Brazilian aviation figures of renown, from President Getulio Vargas on down. The trip was completely covered photographically by Jackie Martin and many unusually historic pictures are included.

AERODYNAMICS FOR MODEL AIRCRAFT, by Avrum Zier (Dodd, Mead and Co., New York City), 258 pages. $3.00.

This volume covers the complete aerodynamic characteristics of various component parts of the model airplane from an engineering, mathematical standpoint. The data included and the discussion material has been aimed largely at the student of elemental aerodynamics and the book makes a good ground-school text on the general subject. The application of the principles outlined to model design and construction is made although the aim seems to have been towards full-scale aircraft rather than models.

AIRCRAFT MATHEMATICS, by Walling and Hill (Macmillan Company, 60 Fifth Avenue, New York City), 189 pages. $1.25.

This book was written as a mathematical text for pre-flight training of aviation cadets of both the U.S. Army Air Forces and Royal Air Force. It is a comprehensive study of mathematics from elementary arithmetic to trigonometry, including algebra. Application of these principles to special aviation problems is clearly made and it is useful as a refresher course in mathematics to all engineers and aviation students.

FLYING FURIES, by Keith Ayling (Thomas Nelson and Sons), 44 pages. $1.50.

This is a very cleverly conceived volume on the fighter airplane from its inception to the very latest types now in use and contemplated. It is beautifully illustrated by Wallis Rigby with pastel drawings as well as photographs.

BOMBS AWAY, by John Steinbeck (The Viking Press, New York City), 184 pages. $2.50.

This is the story of the Bomber Command of the United States Army Air Forces told by a man who most certainly needs no introduction. Written with the cooperation of the Air Forces, who planned his itinerary and detailed officers and enlisted men to explain the work at the many fields visited, this book tells its story simply and clearly, profusely illustrated by John Swope with 60 photographs of bomber schools. A complete résumé of training necessary to develop the member of the bomber team, be he pilot, navigator, radio operator, bombardier or gunner, is clearly outlined.

BAG OF SMOKE, by Lonzo Anderson (Viking Press, New York City), 179 pages. $2.00.

Here, for the first time, is the complete story of the balloon and the Brothers Montgolfier, who are summarily credited with constructing and flying the first successful balloon. Actually there were six different balloons developed by the brothers, the last of which, Reveillon, flew before King Louis XVI. Quaintly illustrated by Adrienne Adams, it is an interesting addition to the aviation historian's bookshelf.

THE FLYING TIGERS, by Russell Whelan (The Viking Press, New York City), 224 pages. $2.50.

The Model Builders of Yesterday Are the Pilots, Navigators and Bombardiers of Today!

If you were to read the letters that come to us every day of the week from America's student fliers, praising the value of their model building experience, you'd realize how much it will mean to you to keep up your model building.

VICTORY

Vultee Vengeance

ALL AMERICAN

Red, White & Blue Patriot of the Air

WINGSPAN 45" — $1.00 — LENGTH 34½"

POSTPAID OR AT YOUR DEALER

Flying Scale Models of America's Latest

Warplanes

25" WINGSPAN

Complete Kits

50c EACH

Postpaid or at your dealer

SQUADRON

North American Apache P-51

The "Flying World of Tomorrow" will offer amazing opportunities to young men with a working knowledge of aeronautics—and you can get this working knowledge through your model building which teaches you aero-dynamics, design and the theory of flight.

New Bell Airacobra P-39

Grumman Wildcat

Curtiss Warhawk P-40

PARACHUTE PLANE

. . . with Automatic Trap Door Release

WINGSPAN 40" — $1.50 — LENGTH 28"

POSTPAID OR AT YOUR DEALER

30" DEFENSE SERIES—95¢ EACH

Curtiss P-42

Postpaid or at your dealer.

Brewster "340"

Curtiss SB2C-1 "HELLDIVER"

REPUBLIC P-47 "THUNDERBOLT"

BUY MORE U. S. WAR SAVINGS STAMPS & BONDS TO SPEED VICTORY!

★

3 GAS-TYPE "HITS" $1.75 EACH

Less rubber wheels . . . Postpaid or at your dealer

THEY LOOK, FLY and SOUND JUST LIKE GAS MODELS!

FIREFLY

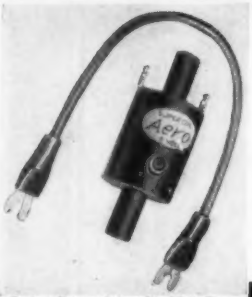
MISS AMERICA

FLEA

"GAS MODEL HEADQUARTERS" **SCIENTIFIC MODEL AIRPLANE CO.** 218-220 M-6 MARKET ST. NEWARK, N. J.

AMERICA'S FINEST
IGNITION EQUIPMENT

PROMPT SHIPMENT FROM STOCK



AERO FEATHERWEIGHT
America's lightest, most efficient spark coil. Standard equipment of the finest model engines. 3 volt operation. Weighs 1½ oz. $2.25

AERO SUPER
Lightning Start, Low Battery Drain, Peak Performance. Starts and Operates on Two Pen-Cells. Weighs 2¼ oz. $2.25

AERO RACER
The fastest coil in the world. Steady spark at 15,000 r.p.m. Designed specially for race cars and speed boats. 3 volt operation. Weighs 3 oz. $2.50

AERO QUALITY
Special all-purpose Coil. Operates on Pen-Cells or Batteries up to 4½ volts. Weighs 2½ oz. $2.50

HI-Tension Lead Wire 15c *Matched Metal Case Condenser* 25c
Ask your dealer to show you the complete Aero line—today.

Each coil complete with High Tension Lead and instructions how to obtain longer life from your Batteries and ignition.

AERO SPARK CO. Box 506 Hicksville, L. I. N. Y.

This is the complete, authentic, true story of the fabulous "Flying Tigers" who shot down 286 Japanese airplanes officially in less than six months. There were some 70 officers with sometimes as few as 55 airplanes, out of which only eight fliers were lost against nearly 1500 Japanese fliers lost in the battles. The book is amazingly well written and completely illustrated with breathtaking photos.

WHY MEN CAN FLY, by M. K. Chapin (Reynal and Hitchcock, New York City), 338 pages. $2.50.

This volume is a complete encyclopedia on the question "Why does an airplane fly?" As its title suggests, it is a very complete answer to that question and includes everything on the subject, from weather and winds to sparkplugs and ribs. It is written in a very free, easy style and is complete illustrated. A complete index affords ready reference to the various topics discussed. A very good book for the beginner in aviation.

AIRCRAFT LOFTING AND TEMPLATE LAYOUT, by Howard Thrasher (Aviation Press, San Francisco, Calif.), 212 pages, $3.50.

This volume is a rather complete engineering approach to the subject and includes descriptive geometry, template layout, lofting and "problems and answers" sections. It was written as a textbook for the student loftsman but engineers will find it equally useful for layout work on the drafting board. It is almost entirely composed of drawings and examples clearly defined and drawn and instructive. The work is also applicable to ship lofting.

ELEMENTS OF AEROFOIL AND AIRSCREW THEORY, by H. Glauert (The Macmillan Company, New York City), 228 pages. $3.50.

This is a very well-known British work on aerodynamics which has now been made available to American engineers. It is a comprehensive study of airfoils including their special applications in the form of propellers. Differing from standard American works on the subject, it is a refreshing approach to the problem and many derivations are given which will be of interest to the even more advanced engineer.

VICTORY

The Great Yankee "Doodle"

(Continued from page 8)

had, with what they really had. The gross weight, as they originally assumed it, was compared with the gross weight as it appeared now. The new gross was arrived at by analyzing the drag or resistance characteristics of the whole plane, still on the drawing boards. The more drag, the more fuel it would take. The more fuel, the heavier the gross weight. If it turned out the plane was going to weigh more than the wing area and the horsepower they had allowed for, then adjustments would have to be made. As these and other details were examined in the cold light of mathematics, there were more and more compromises to be made in the drawings.

Obviously progress was made. There was nothing inherently wrong with the great Yankee doodle, so the designers turned to other specific considerations.

The bombers of the day provided nothing for the crew but cold and noise. The Boeing engineers thought a comfortable crew would be a more efficient crew, so they provided sound-proofing and a heating system. In the planes of 1934, a machine gunner stood up behind a small windshield and blazed away. In the earliest Boeing Fortress, each gunner was provided with plenty of armament and streamlined "blisters" in fuselage top and sides.

Then there was the matter of flight controls. The larger planes of the day took plenty of beef to maneuver. Since the better than 30,000 pounds of Fortress was to be a really enormous bulk to handle, the Boeing designers harnessed most of the control job to the airflow. They put the breeze to work by means of small "tabs" on the controls which helped to move the big control surfaces.

Flaps, bomb doors and the retractable landing gear of that day were operated largely by hydraulic controls. Boeing's experience with the "247" and other airplanes indicated that electrical controls could be made more positive and reliable. So the designers substituted electrically driven motors as a safer bet. Today, the electrical system takes combat punishment as no other type of control can.

All in all, the first edition of the Fortress was a whole series of innovations. It was completed within twelve months from the day of that historic huddle in Claire Egtvedt's office. Its non-stop flight from Seattle to Wright Field in Ohio broke all records of the day for heavy aircraft. It was the only four-engine bomber entered in the Air Corps competition. No other plane appearing at the same time, or model based on it, ever proved to be successful in active combat. Apparently, somewhere mixed in the graphite of the pencil points that roughed in the original sketches, there was a bit of star dust.

Long after the first model made airplane history, Boeing engineers were progressively refining the great plane. Turbosuperchargers were added, and larger engines. The one major design alteration was the dramatic sweep of the big dorsal fin. While many of its features, like the fin, are vastly improved today, the truly remarkable thing is this—the basic design of the Fortress is the same today as it was eight years ago.

Today, we read constantly about the B-17's performance in combat areas, and of the men who fly the bomber. We read a lot about its stepped-up production, and the men and women who are building it. We are not likely to hear very much about the design engineers who conceived it. Their wandering pencils are busy sketching newer and more lethal weapons of the air, but their thoughts wander now and then to the day when peacetime models may take shape again on their drawing boards.

VICTORY

NEW REDESIGNED MODEL OF *Dick Korda's* WORLD RECORD HOLDER
WINNER OF MORE CONTESTS THAN ANY MODEL IN THE WORLD!! SIMPLE AS ABC TO BUILD AND FLY!!
A time-tested champion! Proven in actual competition the world's best flying model. Winner of contests everywhere—even when made by beginners.
New Features include polyhedral wing, finished all steel landing gear, instructions for one-bladed fold-back prop and numerous other modern refinements.

43" WINGSPAN 69¢
Add 15c by mail

Manufactured Exclusively by
bVRd
MODEL AIRPLANE CO.
2113-2117 East Oliver St. Baltimore, Md.

NEW CATALOG 10c
Over 100 multi-colored action drawings of modern battle and sport planes.

JOBBERS: Get this profit making line in all price classes—10c, 25c, 50c and $1.00. We are making prompt deliveries.

EVERY MODEL BUILDER SHOULD HAVE THESE TWO BOOKS

Tom's Book of Flying Models

30 pages—100 illustrations

At your dealers 10c; 15c postpaid

Third Printing

You will appreciate this book whether you are a novice or an experienced builder.

Many builders have told us the instructions on covering are the best yet.

It explains in great detail how to build a Spitfire Fighter.

It shows some of the short cuts builders use.

It tells how to do corner cementing in order to get the strongest joints.

It shows the correct way to put on stringers so as not to distort the frame.

It is full of useful information.

Flying Models — How to Build and Fly Them

118 pages—500 illustrations

At your dealers 25c; 35c postpaid

It shows the different methods of pinning and cementing.

It gives three methods of building fuselage frames.

It shows the construction of wing frames with butt, fish nose and slotted ribs.

It tells how to cover fuselages with flat sides and those with curved surfaces.

It shows how to assemble low, mid and high wing monoplanes.

It shows how to assemble different types of biplanes.

It shows how to check the alignment.

It is chock full of ideas. Keep it handy and build better models.

These two books and a full size plan of our new Pilot Trainer 50¢ Postpaid

PAUL K. GUILLOW, Wakefield, Mass.

Building the Vultee Valiant

(Continued from page 25)

perpendicular to the keels. Cut notches in the bulkheads and insert the 1/16" sq. stringer along the thrust line, being careful not to pull the fuselage out of line. Place the remaining stringers, cutting the notches as required with a sliver of a razor blade. Once a stringer is attached to one side, always place another in the corresponding position of the other side. After the stringers are all attached, the temporary brace at the cockpit is inserted.

The engine cowl is made of 1/16" sheet cemented between bulkheads A and B. Note that the sheet is laid on top of the stringers to cause a slight rise. Make a paper pattern of the cockpit shape and cut the 1/32" sheet balsa to the required shape. Pins and rubber bands will keep the sheeting in place until cement is dry. Cover the section behind bulkhead D with 1/32" sheet to form the turtleback.

The cowl front is made from three discs of 1/8" sheet balsa which are cemented cross-grain. The discs have the centers removed to the extent indicated on the plans. Attach the unit to the first bulkhead A and when dry roughly cut to shape. Finish by carefully sandpapering the cowl and discs to required shape. The nose plug is hardwood. The removable nose plug is made to fit snugly into bulkhead A.

TAIL SURFACES: Construction of the tail surfaces is easy. Both the stabilizer and rudder are built in a similar manner. To obtain greater strength the stabilizer is built in one piece. All sizes are given in the plans. The tips are soft 1/8" sheet balsa. When dry the frames are removed from the plans. Trim the trailing edges and tips to a streamline shape, using a razor and sandpaper for this work. Check the rudder and stabilizer for warps. If you can, remove with steam. If it is necessary to use wood other than balsa for the stabilizer and rudder, it must be remembered that they be light but still strong. To accomplish this reduce the size of the various parts.

WING: The wing is easiest assembled in one piece; the builder will have to make a left side plan as there was insufficient room for it on the drawing. Ribs are cut from 1/16" sheet balsa and two of each is needed except No. 1. Sand them carefully to the exact size and cut notches for the spar. Spar is cut from 1/16" sheet balsa as shown by the dotted lines. Leading edge is 1/8" x 1/4", trailing edge is 1/8" x 3/8" tapered stock. Tips are cut from 1/8" sheet and assembled over the plans. With pins hold the various parts in place over the plan until the cement has set. When dry, crack the spar and edges and install the required dihedral; recement the dihedral joints firmly. Finally trim and sand the leading and trailing edges and tips to conform with the airfoil shape.

To keep weight down to a minimum the builder using heavier wood will have to use material of smaller crossection, particularly the leading and trailing edges. Ribs should be cut from the thinnest stock and lightening holes at points of little stress will tend to reduce the weight of heavier material.

A landing gear of the type used on the Valiant always presents a problem to the model maker. However, the landing gear developed for this model is easy to make, accurate in appearance and strong enough to take all the abuse the model can give. .040 steel wire is used and the top is bent in such a manner as to join the wing spar and rib No. 3. Make a right and left strut. With thread bind the struts to the spar and then use needle and sew right through rib No. 3, and about the wire. Apply several coats of cement to the thread wrappings and adjacent areas. The rubber tubing covers are not slipped on until the wing has been covered.

Wheels may be purchased or they can be made from laminations of 3 1/8" sheet discs. Cement washers to both sides of each wheel so they will turn freely and accurately.

PROPELLER: Select a very hard balsa or soft pine block of the correct size for the propeller. Drill the tiny hole for the prop shaft and then cut out the blank as shown. A right-handed propeller is to be carved. Cut away the back face of the blank first until the backs are as desired, then cut away the front until blades are of proper thickness. Reduce the depth of the hub and shape the blades in a manner similar to the prop shown in the photos. With rough and then fine paper sand the propel-

Build This Big M-4 Medium Tank

New Rogers Scale Model 3/4" to the Foot

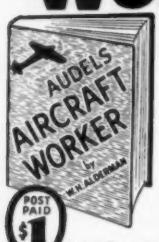
Just what every scale model builder has wanted—a big tank model. This new kit contains everything you need to make a model that is handsome in appearance, unsurpassed in realism and detail. From the unretouched photo above you can see how closely the finished model resembles American Tanks now serving the United Nations in Africa and elsewhere.

Get the Kit at Your Dealer's Model Counter

Rogers Motor Co.
743 Beaubien, Detroit, Mich.

BUY WAR BONDS FOR VICTORY

AUDELS AIRCRAFT WORKER



Now Ready

Answers Your Questions. Every Mechanic & Aircraft Worker should own this useful book, containing clear, concise, practical information, pointers, facts and figures relating to correct modern shop practice.

9 Sections—240 Pages —Fully Illustrated —Covering

1—Aircraft Materials, Terms, Parts. 2—Blueprints, Working Drawings. 3—Mathematics, How to Figure. 4—Layout and Bending. 5—Tools and Machines. 6—Riveting, Spot Welding and Hints. 7—Fabrication, Blocking, Angles, etc. 8—Assembly, Fuselage, Wing & Final—How to Use Tools. 9—Tables & Data, Symbols, Army & Navy Specifications, etc.

Money back if not O.K. To get this assistance for yourself mail coupon today.

ASK TO SEE IT TODAY

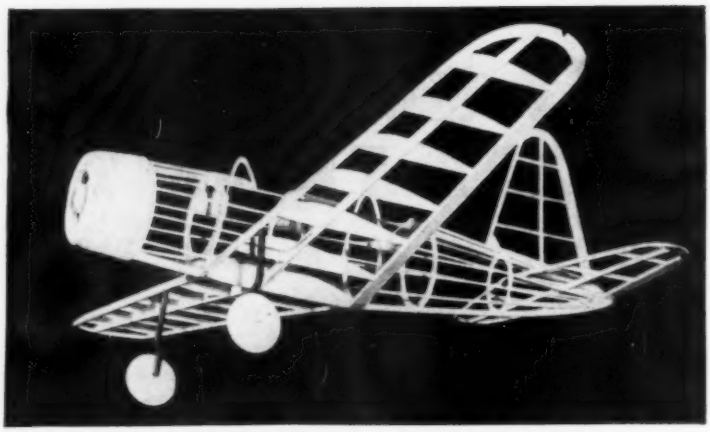
AUDEL, Publishers, 49 W. 23rd St., N.Y.
Mail AUDELS AIRCRAFT WORKER (Price $1). If satisfactory, I will remit $1 on its safe arrival, otherwise I will return the book.

Name ----------

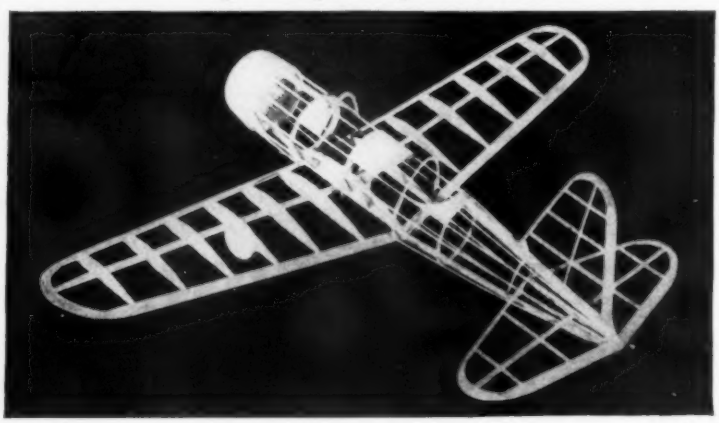
Address ----------

Occupation ----------

Employed by ---------- M.A.N.



Above and Below **Construction is simple, but light and strong, made up of comparatively few parts**



ler to a smooth finish. It is wise to install some type of free-wheel on the prop. Apply several coats of clear dope with light sanding between each to smooth and harden the surface.

The nose plug is purchased or made from hardwood such as pine, etc. Fix the line of thrust by cementing washers to the front and back of the plug.

.040 music wire is used for the propeller shaft. A loop to which a mechanical winder can be hooked should be bent on the front of the shaft. Place several washers between the propeller and nose plug to reduce friction.

COVERING AND ASSEMBLY: First step in preparing for covering is to work over the entire structure with fine sandpaper for a neat covering job. Regular colored tissues or Silkspan is used, banana oil or thin dope is the adhesive. Use individual sections of tissue for each flat section of each side of the wing, tips, tail surfaces, etc. In covering the fuselage it will be necessary to use numerous small pieces to work around the curves without wrinkles; the tissue must be lapped carefully to assure a neat covering. Lightly spray the covered parts with water to tighten the tissue. The flying surfaces must be supported level while drying so they will not warp.

Following is the recommended procedure for assembling the Valiant: Cement the wing to the position indicated on the plan; if the structure has been reproduced accurately, the angle of incidence will automatically be correct. The 1/32" sheet fillet pieces are shown on the plan. This pattern indicates the shape of the fillets on the original model but most models will vary somewhat, so paper patterns should be made to fit your model exactly before the sheet balsa ones are cut. Once the fillets are cemented to position, the several small openings at the junction of the wing and body should be filled in with scraps of soft 1/16" sheet balsa. Sand smooth and cover the fillets with colored tissue.

To set the stabilizer in position it will be necessary to temporarily cut the keel in the rear. Cement the stabilizer at a slight degree of negative angle. The rudder is attached exactly perpendicular to the stabilizer and it is offset 1/16" to counteract torque. Small tissue fillets at the tail surfaces will enhance the model's appearance. Moisten any wrinkles and permit to dry before applying a coat of clear dope to the entire model.

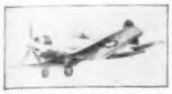
Addition of various minor details completes the construction. The cockpit enclosure is made from thin sheet celluloid. Make accurate patterns before cutting the celluloid; avoid cement smears when cementing in place. Slip the rubber tubing on the wire struts. Wheels are held to the axles by washers soldered to place. Control surface outlines are black tissue strips doped to the covering. The cowl front and top of the fuselage anti-glare is painted black. The insignia used on the original

"WORK OR FIGHT!" *MODEL-MAKING* RELIEVES *TENSION*

POLK'S OFFERS A SELECTION OF ALMOST PRE-WAR CAPACITY!

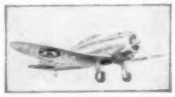
30" FLYING SCALE PLANES 95c
All parts-in-the-kit, full size plans! Modern design, fascinating projects! (BY MAIL: add 15c per kit)

BLACKBURN SKUA
British aircraft carrier based fighter. Will be making Mediterranean history. 95c.



VOUGHT SIKORSKY
The XP4U-1 is a shipboard fighter with inverted gull wings for low C.G. 95c.

REPUBLIC GUARDSMAN
Originally known as Seversky. This is a ship you will hear a lot about. 95c.



SPITFIRE
Famous fighter of the R.A.F. Easy to build, graceful flier. 95c.

DYNA-FLASH COIL

For all A, B or C motors. Quick start, low drain. 1⅞ ozs. lightweight. Unconditionally guaranteed. **$1.75.**

ECONO-COIL

Delivers a fast, hot spark—quickly! Complete with high-tension terminal and lead. For A, B and C engines. **$1.00**

HURLEMAN BIG CARBURETOR

Made integral with 1¼ oz. capacity metal tank. Easy to take apart for cleaning. Designed for large bore motors and midget racers. Increases R.P.M. up to 1500 "turns." $3.50

ARMY TANKS 4 KITS FOR $1.00

¼" and ½" scale super-detailed models; Full size plans included: Choice U. S. Williams, Amsco, Liberty; Canadian Vickers; Greek Cardon-Loyd; Swiss Reggi; British Whippet; Anzac Hornet (Any 4 $1). By mail: Add 20c, pkg.-postage.

COMPLETE PLANS BY WYLAM
AT LAST! All in 1 compact volume! 14 detailed, 3 views and 7 layout plans of 21 famous planes. Also, plans, data and text instructions for construction of Cyclone, Whirlwind and Twin-Wasp, Jr. Engines, Meticulous, precision plans—a modeler's treasure! Complete **$1.50.**

MODEL AIRCRAFT HANDBOOK by WINTER

Famous AIR TRAILS Editor's book, new, revised edition contains a chapter outlining how to get around material shortage; Balsa, Rubber Substitutes, etc. 300 pages, over 100 illustrations. **$2.00.**

C. H. GRANT'S FAMOUS STANDARD MODEL BOOK

Model Airplane News Editor's standard work for airplane modeller. New edition. 528 pages. 205 Diagrams and Plans. A basic trainer for aviation career. Helps you produce consistently fine models. **$3.75.**

CALLING ALL GAS ENGINES

Life Begins In '40 (Three!)
Take out that engine you "retired"—or check with your fellow "gasoleers"—for any unused engines they may be inadvertently hoarding! Many gas-flyers are "grounded" due to current lack of engines! How about YOU DOING YOUR PART to KEEP 'EM FLYING by getting those inactive ones back into use? Lend-lease, donate or SELL YOUR ENGINE! If no facilities near you, we will help you dispose of it! Bring or send it for LIBERAL PAYMENT! We'll send you WAR STAMPS (or bond) CASH or MERCHANDISE CREDIT whichever you choose AFTER YOU APPROVE THE LIBERAL OFFER WE MAKE!

★ BUY WAR BONDS AND STAMPS ★

CAMOUFLAGE KIT

8 Official Army colors with thinner. Waterproof. Can be applied over doped surfaces. Quick drying. For planes, ships, guns, tanks, etc..... $1.50 p.p.

SQUADRON INSIGNIA DECALS IN FULL COLOR!
"Soak 'em, Slide 'em, Stick 'em"
Accurate, full color reproductions of all United Nations (including new designs) and Axis types. Also: Decorative decals. Complete illustrated list of several hundred kinds for stamped, self-addressed envelope.) No postage, please.

128 PAGE 'HO' BOOK

YOURS PRACTICALLY A GIFT
Biggest "pocket-size" book of its kind! Revised right up to date, with lots of technical data. Interesting RR QUIZGAME. 25c (coin or stamps) contains 25c cash-value certificate.

OFFICIAL PLANE PHOTOS PKGE OF 32 25c
Choice of U. S. and FOREIGN
U. S. ARMY and NAVY Fighters, Dive Bombers, Torpedo Bombers, Light and Heavy Bombers, Paratroop Transports. Includes many new types. Reproductions of official photos. READY FOR FRAMING ea. 5" by 8" (By mail—5c extra.) 25c

ZIER'S ILLUSTRATED GROUND COURSE IN AERODYNAMICS

This book is a personalized RAPID ADVANCE course in aerodynamics, the principles which govern all flight! 24 fascinating chapters, covers every subject in the field! 259 pages, over 300 illustrations. **$3.00.**

"Building Flying Model War Planes"

Emanuele Stieri's "just published" authentic book. Contains official plans for 60 allied and enemy models, 1/72" scale with clear photos. **$2.50** Packet of templates for building models in the book **$1.50.**

FLYING MODELS

Paul K. Guillow's excellent, pocket-size book contains comprehensive descriptions of building methods with lots of ingenious shortcuts for advanced modeler, and useable by beginner, too! **25c.** (By mail, 30c.)

POLK'S FOR GREATEST VARIETY!
DOUGLAS B-19

19" wingspan, accurate scale model of this famous ARMY bomber. **$1.00.**

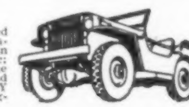
LOCKHEED P-38

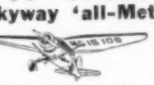
13" wing-span solid model of this famous ship! It's all in the kit! **$1.00.**

GRUMANN SKYROCKET

16" wingspan, a handsome solid replica of famed original **$1.00.**

ALSO: MESSERSCHMITT No. 110 (14") in ¼" scale, solid-kits: WILDCAT, JAP ZERO, STORMOVIK, MUSTANG, HEINKEL, VANGUARD, LOCKHEED P-38, SPITFIRE, P-40, VOUGHT-SIKORSKY, BOULTON DEFIANT, SKYROCKET, THUNDERBOLT, AIRCOBRA, each 25c (By mail: add'l 20c for $1 kits, 10c for others).

Build A JEEP

The war "limousine" used by The President at Casablanca! Scale model kits in heavyweight pulpboard 29c; Wood kits 50c; Giant size $1.25. Detailed plans and turned wheels in each! (BY MAIL, add 15c for packing-postage.)

30" STINSON RELIANT 65c
Skyway 'all-Metal' KNIFE—FREE!

Popular model, detailed plans with turned nose, all balsa. Kit alone valued at 69c. Special, only..... 65c

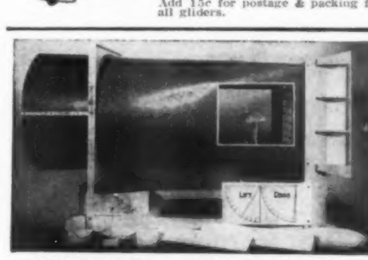
FREE SKYWAY ALL-METAL MODELER'S KNIFE, with reversible, double-edge blade with each STINSON RELIANT (BY MAIL: Kit and knife, add 10c)

Condor Glider $1.00

Advanced soarer, 7 ft. Class "E," 324 sq. in. wing area. For tow-line or hand launching.

Eaglet Glider 50c

4 ft. pod shape fuselage, unusual tail boom. Class "D" Towline or Hand Launch. Add 15c for postage & packing for all gliders.



WIND TUNNEL
Here's what every scientific and serious modeler has been waiting for! For your own, club or classroom use. Made of durable materials and includes complete directions for demonstrating many aerodynamic theories and several test models. Accurately indicates lift and drag forces to 1/100th ounce. Measures 26" high, 27" wide, 41" long. Complete..... **$100.00**

ILLUSTRATED HOBBY CATALOGS—NOW READY

New Edition: Airplanes, Accessories, Supplies, illustrated throughout with up-to-the-minute "available" items! 10c (coin or stamp) brings your copy! POLK'S SHIPYARD, 128 page boat book, convenient pocket-size. Most complete of its kind! 25c (coin or stamps) contains 25c cash-value certificate.

POLK'S MODEL CRAFT HOBBIES
[Dept. MA-6] 429 7th AVE., N. Y. C. BETWEEN 33rd & 34th Sts.
(Entire 2nd and 3rd Floors) *Open Thurs. 'til 9:30 p.m.*

THE NATION'S *Leading* HOBBY *House!*

Again MODEL CRAFT leads the field with the DE HAVILLAND
MOSQUITO
25¢
Simple to construct—modelled from authentic 3-view plans. Kit No. 25F-D.

Other New Model Craft Models

Kit N—Westland Whirlwind 20"	$ .25
Kit O—Russian Stormavik 24"	.25
Kit P—Jap Zero Fighter 24"	.25
Kit 107F—Beaufighter 30"	1.00
Kit 153F—Catalina Flying Boat 36"	1.50

Only MODEL CRAFT

gives you ALL these features

- **Tru-Cut semi-carved propeller.**
- **Stronger and easier construction.**
- **Authentic and accurate plans.**
- **Rubber ration slips in every kit.**
- **French and English instructions.**

Order from your dealer, or write direct, adding 5c to cover packing charges.

Send 5c for new Model Craft No. 43 Catalogue, just off the press.

Ration Slips for Purchase of Rubber included in all Model Craft Rubber-Powered Kits.

MODEL CRAFT HOBBIES
LIMITED
56 Esplanade St., Dept. 124, Toronto, Canada

Power Mist — Spitfire
Proven Superior Racing Fuels

NEW—
"BLUE BLAZER" SOLVENT FUEL
Easy starting, castor lubrication. Will not gum or draw moisture; excellent for protective clean-up after using other prepared fuels.

Pints 45c Quarts 80c
For plastic or metal tanks
5 methanol base fuels, 2 blended fuels.
Full information, fuel facts and formulas
Please enclose stamped addressed envelope.

FRANCISCO LABORATORIES
3787 Griffith View Dr. Los Angeles, Calif.

CLEAR DOPE!

Pint $0.75
Gallon 4.00

All orders given our prompt attention.
Include 15c for postal costs on pints.
Gallons shipped Express collect.

MOD-KRAFF COMPANY
4506-08 Freret St., New Orleans, La.
Dept. MA

model was purchased. A tail wheel and other details found on photos of the real ship can be incorporated to make your Vultee more attractive.

FLYING: Our original test model is powered with six strands (three loops) of 3/16" flat brown rubber. It is best to lubricate the motor before placing it within the fuselage. Hook the strands to the prop shaft and then drop the other ends through the fuselage. It may be necessary to remove a small portion of the covering in the rear in order to get the strands into the position to be held by the removable bamboo pin.

Make first flights over soft grass but if none is available, make first tests R.O.G. with but a few turns in the motor. In all probability the model will be out of balance so a small corrective weight may be needed. As correct balance and stability are attained increase the number of turns. Offsetting the thrust line will aid in controlling the amount of circle in either direction, and by tilting the thrust line down a tendency to stall can be eliminated. For maximum performance stretch the rubber motor and wind with a mechanical winder. Keep 'em flying!

VICTORY

Frontiers

(Continued from page 18)

night. This is an amazing feat and naturally it rouses curiosity concerning the planes being used.

The top picture shows the British Stirling heavy bomber, one of the standard bombing planes used for this work and one of the largest and heaviest 4-engine bombers in the world, carrying a bombload of 8 tons. It is well defended by 8 Browning guns carried in 3 turrets, and has proved its worth both in offensive and defensive action over enemy territory. Fuel is carried in self-sealing tanks and the crew is protected by bullet-proof armor plate. This ship is of extremely light construction, considering its size and the load carried; the British are past masters in this phase of aeronautics. It has not the speed of our Boeing Flying Fortresses but instead converts the power into load-carrying ability; it is a case of using power to carry the load rather than attain high speed. Consequently these ships are used for night operations, depending upon darkness for partial protection.

This is not the only bomber the British use for these operations. Another immense ship is the Handley Page Halifax, shown at top left of the next page. This ship is a 4-engine bomber with a wingspan of 99 ft.; length, 70 ft.; 22 ft. high, and powered by 4 Rolls Royce motors. Like other British bombers gun turrets at the nose and tail serve as defensive armament. Its immense size is indicated by a comparison of the wheels with the men standing beside them.

The third ship forming the British triumvirate is the Avro-Lancaster, shown at the top right, page No. 19. Details of the ship can be clearly seen; turrets are at the nose, tail and midship atop the fuselage. You will note that all 3 of these ships are similar in general arrangement, differing only in details of design.

The United States also is developing some highly efficient bombing planes. One of the latest is the Navy patrol boat, Model 31, produced by the Consolidated Aircraft Corp. It is shown on page No. 18, 2nd from the top. Though a fairly large ship powered by two 2000 hp. engines, you will note its sleek lines. It is highly streamlined for this type of ship and is said to the fastest patrol boat ever built. It weighs about 25 tons. Like the Consolidated B-24, it has long thin wings, giving it load-carrying and climbing efficiency. Retractable wing tip floats are featured; they may be seen tucked up against the wings outward from the motors on each side.

One of the most unique and far-reaching aviation developments in the present era is the Sikorsky helicopter. Ever since the dawn of flight man has dreamed of the possibility of rising from the ground without the necessity of a "running start" as with the airplane. Sikorsky through his genius and long experience has finally developed a helicopter which is safe and completely controllable, the latter being the greatest problem facing anyone attempting development of this type of ship. In the bottom picture on page 18, you see a photo of the Sikorsky helicopter suspended in mid-air while the mechanic descends a rope ladder to the ground.

This ship is so controllable that it can be landed "on a dime" and as gently "as a feather." It needs no run on land or water to takeoff; for water operation 2 round airtight tanks serve as pontoons. The rotor at the top is driven by the engine and through the angle of the blades, controllable from the cockpit, the plane can rise vertically, remain motionless in flight or descend. Controls on the rotor also determine the forward speed. At the tail is a small rotor revolving in a vertical plane parallel to the fuselage axis. This overcomes the counter reaction from the rotor and holds the ship steady, allowing the pilot to turn to right or left merely by changing the blade angle of the rotor.

These ships recently have been tested by the Army and may soon be in production. They are expected to give valuable service in convoy duty because they can be carried by every freighter and launched vertically from its deck for scouting duty. Unquestionably it will be a major factor in defeating the U-boat.

The story of the first cross-country flight with this type of ship in the Western Hemisphere is extremely interesting. It was a delivery flight of the first U.S. Army helicopter, flown a distance of 670 air miles—from the Sikorsky plant at Stratford, Conn., to Wright Field, Dayton, Ohio. Mr. C. L. Morris, engineering test pilot of the Sikorsky Aircraft Division of United Aircraft Corp., who made the flight, describes this flight in the March issue of "Air Force." The trip required 16 hr. 10 min. flying time and followed a course across Conn., N.Y., Pa., and Ohio.

The flight, which covered five days, actually consisted of 16 separate flights. The unofficial American airline distance rec-

ord for helicopters was repeatedly established and exceeded, finally remaining at 92 airline miles. A new unofficial world endurance record for helicopters was set at one hour and 50 minutes. This last record compares to the official record of one hour and 35 minutes set by Igor Sikorsky, designer of the ship, in a single place helicopter in 1941.

Three weeks before the delivery flight Morris had attained a speed of 82 miles an hour and climbed to 5,000 feet in the same ship so that the 60 mile speed which he endeavored to maintain could best be described as "cruising."

Stops were made at New Hackensack, near Poughkeepsie; Albany, Utica, Syracuse, Rochester, Buffalo and Dunkirk, N.Y.; Erie, Pa.; Perry, Willoughby, Cleveland, Mansfield, Springfield and Dayton, Ohio.

The two-place ship made the flight without incident, the only mechanical trouble which developed being in the transmission.

Two unscheduled stops were made, and in both instances the only factor considered by Morris were a comfortable house and telephone.

"The size of the available landing field or its surface condition had no influence on where to land," Morris writes.

Because of a storm which cut off the approach to Buffalo, Morris "decided to land and sit it out" near Batavia. This he did between two farmhouses.

Again, a short distance out of Erie, Morris landed to check with his ground party which was traveling by automobile. Here he picked a small field beside the highway he knew his ground crew was following.

Writing of the start of the flight Morris said, "Mr. Sikorsky was not wholly convinced of the wisdom of this flight; he felt that this 'first-of-the-type' should be handled with kid gloves and be delivered to Dayton by truck, thus eliminating the potential hazards of a cross-country flight in a totally novel type of aircraft that had had less than twenty flying hours since its wheels first left the ground."

Mr. Sikorsky joined Morris on the flight from Cleveland to Mansfield and from Springfield to Dayton. During the entire flight the ship followed closely the route taken by the ground crew.

"From Albany to Utica was uneventful except for the pleasure of flying safely up the Mohawk Valley with the hills on either side often higher than the ship. I felt like the Wright brothers, looking down from my transparent perch, 200 or 300 feet above the house-tops," Morris wrote.

"Farm yards full of chickens and animals would suddenly become uninhabited as shelter was sought from this strange hawk—but the yards would quickly fill again as houses and barns ejected groups of human beings gaping skyward."

Between Rochester and Buffalo, Morris continued, "The automobile party and the helicopter went down the highway together, the ship flitting ahead to each crossroad to make sure there was no converging traffic to cause danger—then signalling them to proceed without worry at the intersections."

SUPER "G" LINE FLYING
ENTIRELY NEW & DIFFERENT
PATENTED
Stunts Galore — Super Speed — Full Control
Announcing The SUPER "G" SHARK

IT'S HERE, A Sensational New Directional Control System, SUPER "G" LINE FLYING and a Sensational New Elevator Type Control Model, The SUPER "G" SHARK, illustrated above. Especially designed for Super Speed and Stunt Flying, this Mighty Shark roars through space at speeds of over 100 M.P.H. Yet, so simple in construction and operation that even the beginner will experience no trouble. May be powered with any class "C" motor, such as the Ohlsson "60's," the Tiger Aero, the Super Cyclone, etc.

The New Super "G" Shark Construction Kit is a Prize-Winner. Contains plenty of fine quality, carefully sawn Wood, Hardwood, Plywood, Printed Parts, Cement, Dope, Covering Paper, Spring Wire, Streamlined Wheels, Super "G" Line Control Parts, etc. Together with a large fully detailed plan and instructions for building and flying.

COMPLETE $3.95 KIT
POSTAGE 30c

REGULAR "G" LINE & FREE-FLIGHT MODELS

BABY SHARK SUPER SPEEDSTER

COMPLETE $1.98 KIT
Postage 20c

The new BABY SHARK, Super Streamlined Speed Ship, is designed for all Class A and B motors. This snappy little job flies at tremendous speeds of from 50 to 75 M.P.H.

INTERCEPTORS UP

TIGER SHARK SPEED DEMON

DELUXE $4.95 KIT
Postage 30c

The TIGER SHARK, Super Speed Demon, is designed for all ½ H.P. motors. It roars through the air at unbelievable speed of from 60 to 90 M.P.H.

Fly the Sensational New INTERCEPTOR. Super Performance Class B Free-flight model. Tremendous climbing qualities. Kit unusually complete. $2.98 Postage 30c

SHARK P-60 "G" LINE MODELS
New Rubber Power and Gas Power Kits
Build and Fly one of these thrilling new ARMY TYPE PURSUIT "G" Line Speed Ships. All Kits are unusually complete throughout.

Complete Shark P-60 Kits
Rubber Power Kit Complete $1.95 POSTAGE 20c
For All Class C ½ H.P. Motors $2.98 POSTAGE 30c

DESCRIPTIVE FOLDERS, 5c

VICTOR STANZEL & CO., Dept. M., SCHULENBURG, TEXAS

Taking off from Buffalo smoky, hazy conditions cut visibility to less than a mile for a time and Morris steered his course half by compass and half by highway.

He wrote, "Once, as a towering radio mast loomed out of the murk, I became impressed with the value of an aircraft that could come to a complete stop in mid-air if necessary."

Between Erie, Pennsylvania and Perry, Ohio, Morris had the roughest leg of the entire trip. He was flying head-on into a gusty wind varying from 12 to 29 miles an hour, and accordingly stayed close to the ground. "But close to the ground we got the full value of all ground 'bumps.' Every patch of woods had its own air currents; and to the leeward of a town or village the air was extremely choppy," he wrote.

"Many times we would lose 75 to 100 feet of altitude in a down-gust—and we were only 300 feet above the ground most of the time.

"But the ship behaved beautifully. It didn't pound and pitch like a conventional aircraft under similar conditions. All it did was float up and down, and get kicked around sideways. There were no sudden shocks, and even when it yawed to one side or the other, it was not necessary to use rudder to straighten it out. Given a few seconds, it would come back by itself."

The Germans lately have been turning out a number of planes of unique design. One, shown in the left picture, center row, page 18, is one of the first double fuselage airplanes of the Luftwaffe, and though it is a short distance reconnaissance ship it is as maneuverable as a pursuit ship. Unlike reconnaissance planes, it has strong offensive as well as defensive weapons, carrying cannon and machine guns of the latest type. It is operated by a crew of 3 and its double fuselage arrangement allows unobstructed view of all sides from the center nacelle. You will note that a clear rearward view can be obtained from the rear glassed-in compartment of the nacelle, made possible by the double fuselage arrangement. It is powered with 2 Argus engines.

Another one of Germany's latest operational aircraft, and one which has been mentioned as active over many fronts, is the Messerschmitt Me 210, a 2-seater fighter bomber. It is a development of the former Me 110, but is quite different in appearance. It is shown in the right-hand picture, center column, page 00. It is powered with two 1395 hp. engines, has a top speed of about 365 mph. Armament consists of 6 guns, including 2 cannon in the nose and 2 in small side turrets. Like other German aircraft, plenty of window space is provided, the pilot and gunner's cockpit resembling a greenhouse. The general style of the ship is not unlike the P-38 though this plane employes a single fuselage and fin instead of the twin fuselage arrangement.

Though we read daily of the achievements of the Russian Airforce, less is known concerning its planes than of the planes of other countries. Consequently the average person has no conception of the efficiency of this airforce. There have been few pictures of Russian heavy bombers, but the one shown at the bottom of page 18 will give you some idea of the keen engineering sense of Russian designers.

The picture shows the giant 4-motor Russian bomber that arrived in England last year, bearing Soviet Foreign Commissar V. M. Molotov, who was the ambassador for Russia signing the Anglo-Russia Mutual Assistance Pact in London. This plane is a 4-motor craft of metal skin-stressed construction. Its great size is indicated by the men standing beneath it. It follows the general trend of bomber design, employing nose and tail gun turrets. A sighter's compartment is at the underside of the nose, with pilot compartment on the top of the fuselage. Unlike our bombers, liquid cooled engines are employed. Up to the present time these heavy bombers have not been used to great extent in bombing operations over Germany; however, in the future, as the Russians push the Germans westward, Germany can expect to be bombed from the East as well as the West.

VICTORY

Sky Scouts

(Continued from page 29)

Now you turn quickly to the phone and make your report to Army headquarters. First, you give the type of ship, indicating the number of engines; its approximate altitude, low, high, very high; its direction relative to your post and, finally, the direction in which it is flying. This is all that is necessary; however other details, if you can supply them, are of great help so you tell your story.

Hanging up the receiver you glance out quickly and see approaching another plane —silhouette 14C. At first glance you see that there is no engine at the nose but the suggestion of one nacelle on one wing. Immediately your experience suggests a 2-engine ship.

Now you glance at the fuselage; it is quite long and slim, mounting a broad stabilizer at the rear. At the nose are pilot's and gunner's compartments. This is all you need to make you hurriedly lift the phone and make your report: a 2-engine bomber, its mission being indicated by the long slim fuselage with the nose gunner's compartment, with twin fins at the rear.

The nationality? The square outlines of the fin suggests German and the elliptic wings of which you get a fleeting glimpse also indicates German design. The slim long fuselage is either German or Japanese; however the evidence is preponderantly German, especially as you have noticed that the engines are liquid cooled. While you are waiting for your call you recognize the silhouette as the Junkers Ju86 P2, an extremely high altitude bomber.

Well, you have spotted three ships, quite a "good bag" for the short time you have been on duty.

A little practice in recognizing silhouettes similar to the ones shown here, by various units throughout the country, will make spotters proficient and possibly of vital help in the war effort. However

BERKELEY "SPECIAL OF THE MONTH"

Watch the Berkeley "Special of the Month" Column every month, for the best values ever offered to model builders. Every item will be hard-to-get or hard-to-beat. Don't forget,—watch this column every month.

X-Acto KNIFE CHEST

Super sharp X-Acto Knives with 9 extra surgical steel blades. All in a handy wooden knife chest with separate compartments for each blade..... **$3.50 P. P.**

CHAMPION SPARK PLUGS

Re-Vitalize your engine with new ignition equipment. Change that old dirty plug for a clean, new Champion. **Type: V; V-2; V-3 for Free Flight Models. Type VR-1; VR-2 for Control-Line Models.** If you are not sure of the type for your motor, just send the make and model number ..... **50c P.P.**

AERO FEATHERWEIGHT SPARK COIL

The coil with the winning punch that adds those few extra rev's that make the difference in contest flying. Weighs only 1½ oz. ..... **$2.25 P. P.**

HEAVY DUTY METAL CASE CONDENSER

For top performance with AERO SPARK COILS..... **35c**

The new **AVIATION DICTIONARY**

by Jordanoff

Over 2000 separate terms defined, every one separately illustrated. The only book of its kind. A book every aviation enthusiast must have. Order your copy at once.

$3.50 P.P.

THE MODEL AIRCRAFT HANDBOOK

by William Winter

292 pages—Over 100 drawings.

A book written so every model builder can understand it. Every phase of model building explained, point-by-point..... **$2.00 P.P.**

BERKELEY CHAMPIONSHIP CEMENT AND DOPE

In Economy ½ Pt. Jars

You save money and use the best when you buy Berkeley Finishes. Look at the list of Berkeley Finishes and check your stock. Berkeley dopes are government approved for Army and Navy Models.

Cement — Wood Filler
Clear Dope — Finisher
Thinner — Colored Dope (12 different)
Camouflage Green, Olive, Gray, and Black.

45c jar

Plus 15c postage on one to four jars.

BERKELEY MODELS INC. Hangar M-6 230 STEUBEN ST. BROOKLYN, N. Y.

BY KEEPING ABREAST of MILITARY AVIATION . . .

Berkeley GIVES YOU . . .

AIR MASTERY!

SO THESE MODELS AND THOSE IN THE CATALOG ARE THE WORLD'S GREAT MODEL AIRPLANES FOR PERFORMANCE, CONSTRUCTION AND BEAUTY

mastery with **RUBBER**

Born of a long line of record holders, these rubber-powered Berkeleys are unmatched for long, graceful flight and rugged, sturdy construction. Build them and you'll find they fly like our world record gas jobs.

THE BUCCANEER "30"

30" wingspan—rubber powered

$1.00 P.P.

One of America's most popular rubber powered flying models. The planked fuselage with "crutch" construction is the simplest, strongest method ever devised for building model airplanes. A long range flyer covering 1500 feet to one-half mile consistently.

The kit includes "Air-Tex" parts, "Adjust-O-Pitch" propeller, semi-finished nose blocks, celluloid for windshield, silkspan covering, etc.....**$1.00 P. P.**

AMERICAN ACE "30"

30" wingspan—rubber powered

$1.00 P.P.

Those who want the thrill of flying an "Ace" will want to build this streamlined super ship. Rugged construction with wire landing gear, pylon wing mount, and polyhedral wings. It turns in flights just like the world's record gas job.

The kit includes "Air-Tex" parts, "Adjust-O-Pitch" propeller, semi-finished nose block, celluloid for windshield, silkspan covering. .....**$1.00 P. P.**

mastery in **GLIDERS**

Berkeley proudly presents the first new idea in tow-line launched gliders in ten years. You will find a brand new trend in model building with these exclusive soaring sensations.

SUPER SINBAD

62" Wingspan

$2.50 P.P.

The ultimate in glider design. Tow-line launch with new "Tow-Control" which permits you to steer the model to any part of the field you desire before releasing the tow line. The kit includes complete diecut "Air-Tex" parts, cement, wood veneer and silkspan covering, parts for tow-control.

Great Variety of Gliders in the Sensational Catalog

mastery with **GAS**

Berkeley engineers are justly proud of the many world records made by these sensational gas models.

AMERICAN ACE 54"
The official A.M.A. record holder. $3.95 P.P.

BRIGADIER 58"
The only officially approved gas model of the "Air Youth of America" **$2.95 P.P.**

BUCCANEER "B" SPECIAL 56"
The only gas model with wing slots and spin arresting tail **$3.95 P.P.**

BUCCANEER 36"
Resembles in every way the larger-sized world's record holder. **$1.50 P.P.**

BUCCANEER "C" SPECIAL 6 ft.
Designed for Class C Engines. **$6.95 P.P.**

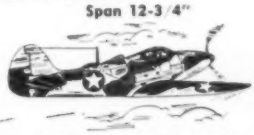
Berkeley's new comprehensive catalog. Packed with illustrated facts about new Berkeley kits and "hard-to-find" equipment, this beautiful catalog is being demanded by model fans everywhere. 10c at your dealer or by mail.

mastery in **SOLIDS**

New additions to Berkeley's Tactical Demonstration Solids complete with cut-to-outline balsa fuselage and wings, and authentic full color transfer decal insignia.

BELL AIRACOBRA

Span 12-3/4"

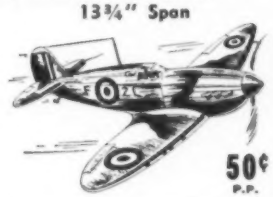


50¢ P.P.

The ship that is giving the axis trouble all over the globe. It is one of the keenest, solid models you can build. **50c P.P.**

SUPERMARINE "SPITFIRE"

13¾" Span



50¢ P.P.

Daily News reports on the "Spitfire" have made its remarkable achievements known to everyone. Real model of a real plane with super-detailed drawings. **50c P.P.**

NORTH AMERICAN B-25

Span 17"

$1.00 P.P.

Now you can build an exact copy of the ship that bombed Tokio. Authentic details and markings of famous "Thunderbird" Squadron. **$1.00 P.P.**

LOCKHEED P-38 "LIGHTNING"

Span 18-1/2"

$1.00 P.P.

The pursuit that has seen so much action in Africa. A "must" in every model builder's collection because of its unusual design, by far the best kit of the "Lightning" you can own. **$1.00 P.P.**

Berkeley Models, inc., 230 STEUBEN ST. (HANGAR M-6) BROOKLYN, N. Y.

REVOLUTIONARY NEW MOTOR

plus plans for SCIENTIFIC NEW MODEL

ONLY $1.49

Power for SKY-KOIL 32
A coil spring, especially made of the finest polished spring steel music wire. A single strand of this spring steel wire will support a dead weight of 255 pounds.

Weighs less than 1¾ oz. Exerts no longitudinal stress, helps absorb shock of crash landings.

Above model designed especially for Sky-Koil 32 by nationally recognized authority on model airplanes

IT'S AN EDUCATION TO MAKE—A THRILL TO FLY—No other motor like it—no more fascinating way to learn the principles of flight—no other value to match this.

SEND ONLY $1.49—For Sky-Koil 32 Motor complete with full scale, easy-to-follow, detail drawings of the Sky-Koil Observer.

YOU CAN'T LOSE—If not satisfied, return motor, carefully packed in original carton, within ten days for full refund.

(Old Users of Sky-Koil 32 send 40¢ for Full-Scale, Detail Drawings of Sky-Koil Observer.)

ROKWELL INDUSTRIES, Inc., 3924 Juniata Street, St. Louis, Missouri
(Missouri Purchasers Include Sales Tax)

enemy planes are not so plentiful as yet, that spotters' ability to recognize and fully occupy their time are extended to the limit.

Many clubs have been looking for ways to improve themselves and help their interest in members. Norman Wyant of 14 E. Basswood Ave., Dayton, Ohio, member of a local unit, makes a suggeston which he says has worked well with his and other units. Each member of the unit watches for aircraft during any one interval between meetings and writes down the type and name of each ship that he recognizes. Then, at the following meeting, the one with the most names is credited with so many points. A chart of the standing of each member for recognizing aircraft is posted at club headquarters. At the end of three or four weeks prizes or special awards can be given.

Possibly other units will find this procedure interesting.

PLANE 14A—Showa SB 99, better known as the Vultee V-11GB before the Japanese decided to "borrow" the designs. The SB-99 as used by the Nips is a fighter-bomber duplicated in every respect to the original Vultee design except the engine; in place of a Cyclone, a Showa 850 hp. air-cooled radial engine is used. It is well protected by two flexible machine guns. In addition to these, fixed guns are mounted for head-on shooting. Maximum speed is believed to be 220 mph at 6,800 ft. altitude. Service ceiling is 26,500 ft. and at a speed of 180 mph range is 950 miles. Several squadrons of this ship have been operating in the Pacific battle area as escorts to bombers. The craft is easily "spotted" because of its typical Vultee style.

PLANE 14B—Mitsubishi MC 20 now converted to Army use as a parachute troop transport and given the designation Y-98. This ship has been used extensively by the Japs on paratroop raids of Allied positions. Its main handicap however is its small passenger capacity: it originally provided for only 11 passengers, and as an Army carrier, it is doubted if this capacity has increased. Maximum speed is only 266 mph; range, 1,240 miles; service ceiling, 23,000 feet. The MC 20 is of monocoque construction and in every respect appears much like an early American airliner.

PLANE 14C—Junkers Ju86 P2, latest of the Ju86 family, is an experimental airplane used for extremely high altitude daytime raids. Its 1,000 hp Jumo 207 engines are turbo-supercharged and can operate efficiently at 45,000 feet. The cabin appears to be "sealed" and in every respect fitted for work in the rarified regions. Maximum speed is believed to be 280 mph at 31,000 ft. At the present time little is known as to armament and bomb loads. The craft is easy to identify because of the Junkers characteristics. The equal taper of both leading and trailing edge of the wing, the pointed tips and the angular fins and rudders are typical of Junkers designs. As this ship is brought into action and more is known about its features, it will undoubtedly prove a worthwhile study for our engineers, for it is believed to be one of Germany's finest machines.

VICTORY

Aviation Forum

(Continued from page 31)

excessive power would have to be used. The structure is far from practical and would be impossible to build with strength. Obviously also there is little space for a passenger compartment; in fact a great deal of airplane would be required to carry passenger or payload. This indicates a trend in a direction opposite to that in which we wish to proceed—today we are trying to reduce the size of our airplane and at the same time carry more load with less power.

Briefly, the difference in lift gained from the helium it is possible to carry, is far outweighed by weight and complication of the structure employed to obtain the slight advantage. The same result can be obtained with far less complication and with greater aerodynamic efficiency. Possibly our readers may have some ideas concerning this; we would like to hear from them.

Comments on the Rules

There have been many comments and some "mud slinging" in connection with the 1942 rules and many model builders live in hopes that changes will be made. All trust that some set of rules can be established that will please everyone. This may appear to be Utopian, and probably is, but nevertheless there are many who feel that the rules can be improved; in fact, if improvement were not possible interest would be lacking.

A number of letters follow which give various points of view—some criticisms are justified, others possibly not, or at least their manner of expression might be improved. Possibly some show the lack of concise and accurate thinking and evidence a concentration on one particular advantage to the exclusion of others but conflicting necessities.

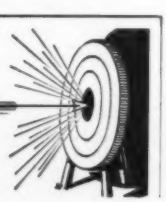
Russell Basye of Oakland, Cal., writes: "I am not in favor of the 1941 A.M.A. rules. I think dethermalizers should be compulsory because of the danger to aircraft observers and also because of the danger of losing the model.

"I like the 10-minute rule because not many gas models will fly 10 minutes three times and there is little chance of there being a tie at a contest."

Dick Diehl of 1449 Morin, Albany, Cal.,

AMERICA'S FASTEST GROWING SPORT
Send 5c for Catalogue showing Targets, Hunting Bows, Arrows, Archery Sets and Accessories. Complete Sets 95c to $15.95.

Dealers Wanted
ACE MODEL PLANE CO.
3149-M Shenandoah St. Louis, Mo.

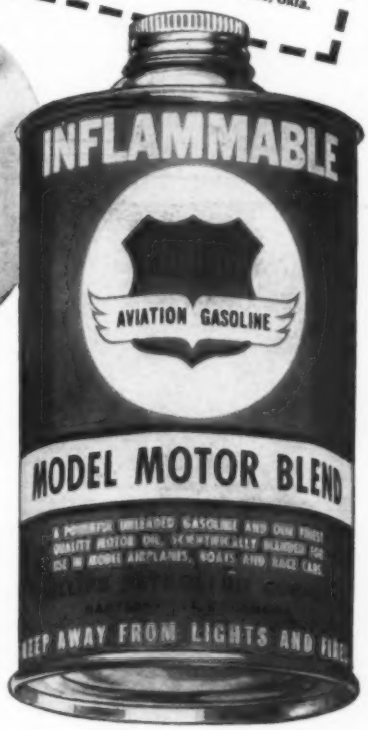


Model Planes *Start Quicker-*
Fly Further with this
Super-Power Fuel!

Send this coupon today, if there is no Phillips 66 Station near you

You can get Phillips Model Motor Blend at Phillips 66 Stations . . . 30¢ a pint. Or mail this coupon and your name and address with 60¢ (money order or stamps, NOT coins). We will send you a full quart promptly, express collect.
(See special note below)

Phillips Petroleum Co., Bartlesville, Okla.



Phillips Model Motor Blend ends hazard of home blending . . . helps keep motors clean!

It's been *proved* in laboratory tests . . . Phillips Model Motor Blend helps model motors start quicker . . . deliver *greater power* . . . higher R.P.M. It can help get maximum performance out of *your* model plane!

Phillips Model Motor Blend is a combination of high-quality gasoline and fine lubricating oil, scientifically blended to give greater climbing ability . . . longer flights. And it's especially suited for breaking-in . . . will help keep your motor *new!*

Cleans Out Dirty Motors!

This scientific fuel-oil blend contains important cleansing and metal-wetting agents that reduce carbon formation and prevent corrosion of delicate parts. *It actually cleans out a dirty motor* . . . helps it deliver *top power* for a *longer period.*

Today there's no need to take chances mixing your own blends of gas and oil. When you use Phillips Model Motor Blend you eliminate a fire hazard and have a fuel that is always uniform in quality . . . convenient to use. Find out for yourself how Phillips Model Motor Blend can step up your plane's performance.

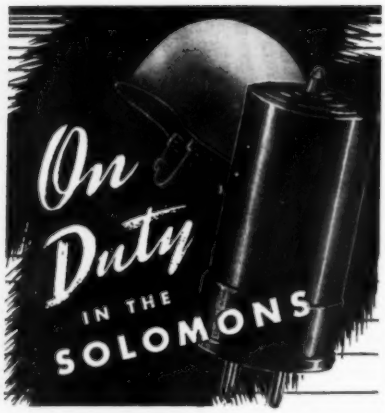
SPECIAL NOTE: *Government regulations now require a non-highway gasoline ration coupon to purchase Phillips Model Motor Blend. Coupon may be obtained from your local ration board.*

Phillips

AVIATION GASOLINE

MODEL MOTOR BLEND

A Model Motor Blend of Gasoline and Oil



WE can't tell you how Smith *Firecracker* Coils are being used in the Solomons, except to say that they're doing a real job in helping lick the Japs. We thought you modelers would like to know this, now that you can't get Smith *Firecrackers* yourselves. But you will someday, and the *Firecracker* will be a hotter coil than ever for its war service.

Write us at any time on any ignition problem—and keep 'em flying!

FIRST because they LAST

SMITH COILS

NATHAN R. SMITH MFG. CO.
105 Pasadena Avenue
SOUTH PASADENA, CALIF.

ATTENTION—Gas Model Builders and Flyers Wear the New "GAS MODEL WINGS" Lapel Emblem

Patented Actual Size

Accurately made and beautifully finished in 12K yellow gold. They're just the thing to identify you as a Model Flyer. Order Now—supply is very limited—only $1.10 Fed. Tax Inc. Satisfaction guaranteed. Immediate delivery.

GUNTER'S — Aviation Jewelers — Dexter, Mo.

REAL ENGINE VALUE

Now Only $15

The GHQ is a miniature gasoline engine that really operates. Over 15,000 sold in the last year. 1/5 H.P. Complete with propeller (or flywheel), fuel, accessories and full instructions. Fully bench tested and ready to run. For boats, planes, midget cars, etc. Send only $1.00—Shipped Collect C.O.D. same day. Send 25c for Catalog of hundreds of hobby items.

Rough Castings Set, including blueprints, only $6.95

GHQ MOTORS

Dept. MT • 40 East 21 St., New York, N. Y.

says:

"In answer to your statement in MODEL AIRPLANE NEWS that if the West Coast modelers didn't like the rules why don't they write? Well, for the third time I am saying that the 1942 rules have received a poor reception on the West Coast especially in concern with gas models.

"The way the 1942 rules are stated we would be flying for precision, which I think should be kept with U-control and G-line flying. We agree that models have to be brought down by dethermalizers or some other means so as not to interfere with this country's defense.

"Our views on the rules are: Instead of the 4 min. time, we on the West Coast found through several contests that with a 10 min. limit and not subtracting that over 10 from the 10 min. made the contest more like they used to be and yet a model flying 10 min. could not travel very far or get out of control. In these new rules we would require a dethermalizer to bring the model down in 10 min. In case there is a tie the winner would be decided by a fly-off or the one with the shortest motor run.

"Outdoor flying means a lot to us; California holds the majority of the gas records and yet the A.M.A. Rules Committee didn't seem to take into consideration the West Coast ideas or views.

"Unless something is done to change these rules the West Coast is thinking of breaking away from the A.M.A. flying under these rules and the 1941 rules commined. Several of the larger clubs are already taking action towards the new organization."

And Paul Romak of 3422 Jordan Rd., Oakland, says:

"In regard to the revolution on the West Coast:

"I joined the A.M.A. with the thought in mind that all fliers should have a set of equal and just rules to be governed by and these rules should be the wishes of the majority, not armchair fliers.

"In the first place, no crosssection rule; what is to be gained by that? Second, limiting flights to 4 min.; anyone that ever flew knows you have to have a thermal to get 4 min. Then how are you going to get your ship down in that time without effective dethermalizers? Third, hand launching; where is the sporting element in hand launching?

"Their rules are not the wishes of myself and any other flier I have spoken to at numerous contests here on the Pacific Coast. The club I belong to knew there must be some rules to follow so we adopted the 1941 A.M.A. rules with these additions:

"Every ship must have a dethermalizer; no flights over 10 min. but 10 min. recorded for any flight over 10 min., fliers allowed to push or shove ship on takeoff, provided he doesn't take a step forward.

"I am proud to say my whole family are fliers; my wife, two sons, brothers and their wives and myself—and we all agree to the above.

"We hope we can very soon straighten out this flying problem to the satisfaction of all model fliers in the good old U.S.A."

Carl Hopkins of W. Va. Discusses A.M.A. Wartime Rules

"Having been connected with model aviation for the past 15 years with no commercial angle or hobby shop connections, I have organized and conducted many model aviation contests throughout the state. I have watched model aviation grow from a small group of boys 'playing with toys,' to a highly scientific avocation that 47 boys of my club are now following as a vocation.

"Public opinion regarding model aviation has changed a lot regarding the constructive features of model aviation to the point where it is now considered a vital war contribution.

"I am very proud of the enviable record made by 'my boys' in the building and flying of model airplanes and of the records they are now making in big aviation as pilot instructors in the Air Corps, technicians and aeronautical engineers.

"Besides organizing and conducting model meets here in W. Va., I get around the various big meets; Nationals, Scripps Howard Junior Nationals and a few of the tri-state affairs, and a few of my observations may be of interest to the Academy and those interested in model aviation as an 'air-conditioner' of our youth.

"I agree that model aviation, *junior aviation*, should have a governing body such as the Academy, but when the Academy gets so weak that they let a bunch of men model fliers railroad a bunch of technical rules into the Academy to be used at official sanctioned meets, rules that are so strict and tough they practically rule out the kids we are trying to start flying, I am forced, and for the good of the future of model aviation in West Virginia, to go back to 1941 rules and pass up the official sanction of the Academy.

"I contend, and it is the consensus of those sincerely interested in junior aviation, that junior aviation does not take in men from 21 to 45. These men who crowd out the kids at model meets should either be in the Army, in big aviation, or organizing, conducting and officiating at junior model meets. Don't get the idea that I am for doing away with the men's hobby of flying model airplanes—I am for it—but the men's contests should be held on separate days in order that 100% attention could be given to the juniors. Have the men's contest on separate days because it's the men who monopolize the juniors. Have the men's contest on separate days because it's the men who monopolize the timers at contests advertised and publicised as junior model aviation contests.

"I have advocated junior aviation for juniors for quite some time and believe that consensus now justifies the ruling for my 15th Annual State Championship Junior Model Aviation Meet which says that no entries 21 years of age or over may compete for the trophies and awards.

"In order to 'Start 'Em Flying' and to encourage the youth of this section to continue their experimenting in an avocation that leads to a vocation, I am wondering if the executive directors of the Academy and the officials of N.A.A. would consider the granting of a special dispensation for this experimental contest and issue an official or special sanction?

"You might be interested in knowing that West Virginia contests last year attracted entries from six states outside of West Virginia. I do not expect a large entry list this year due to the war. However, the awards will be even better than last year's state contest with prizes to 10th place and no entry fee."

* * *

We also received a letter from Andrew Canino, vice president of the Vineland Aeronauts, Vineland, N.J. He says:

"In your November issue of MODEL AIRPLANE NEWS you invited comment on the article sent in by Mr. D. Foote, entitled 'Readers Discussion Corner.'

"As a model builder and flier, and also a Contest Director of Vineland, I feel that everything possible should be done to keep your young boys and girls interested in model airplanes, and that no rules should be passed that would harm the model sport.

"I know the rules as well as Mr. Foote, yet I fail to see where any of the 1942 rules have caused any hardships on our model builders or in any way interfered with the sport. Before writing any further, I would like to say that I have had the pleasure of meeting and associating with Mr. Angus, and I can safely say that no man is more widely respected or beloved by we model builders in South Jersey; not only for his sportsmanship but also for his honesty and loyalty. In the adoption of the 1942 rules Mr. Angus had much further foresight than did Mr. Foote; Mr. Angus took into consideration the fact that the rules would apply throughout the country. Therefore whatever rules were to be adopted had to be fair for N.J. and Pa. as well as Calif. We in Jersey cannot allow our models a 10 min. flight without danger of interfering with our air spotting system or some nearby government airports; therefore the 4 min. rule.

"As secy. and treas. of the Vineland Aeronauts I can assure you that we were informed of the coming rules before their adoption, and heartily approved. Therefore I feel that Mr. Foote is making a very broad statement when he says that in spite of the protests from modelers all over the country these rules were adopted in absolute disregard to the wants and needs of the fliers themselves.

"Isn't it possible that Mr. Angus was influenced by the wish of the majority of model builders? Mr. Foote seems to be disappointed because dethermalizers are not compulsory. Yet he forces a maximum flight of 10 min. May I ask the West Coast model builder how it is possible to get a 10 min. flight, flying in a 15-mile wind and still keep your model in sight of the flying field? What good is your dethermalizer when you have given your ship a 20 sec. motor run, it has obtained an altitude of approximately 500 to 600 ft., your dethermalizer has been set to work at, let us say, 9 min., with a tail wind of 15 mph.? Your model is now a few miles away; would you call that 'keeping your model within sight of the flying field'?

"Never having been in Calif. I do not know what kind of fields they have, but according to Mr. Foote all that is necessary for a Director to do there is furnish

SCALE MODELS by WYLAM

A New Air Age Book Containing the Complete Works of WILLIAM WYLAM, the World's Foremost Model Draftsman

NUMEROUS requests from aeromodelers all over the country have prompted Air Age Inc., publishers of ***Model Airplane News***, to present in one volume all the three-view and plan-layout drawings of Wylam.

"Drawn by Wylam" is widely recognized as a trademark of excellence; for many years the work of this superb draftsman has been distinguished by a remarkably high degree of accuracy and unusual plan-layout.

In "SCALE MODELS by WYLAM" you will find:

- **Fourteen Detailed Three-Views and Seven Lay-out-Plans of 21 Famous U.S. and Foreign Planes.**
- **Plans and Text Instruction for Building the Grumman F3F-1 and 2, Douglas O-46A and Hawk III-C.**
- **Data for Building 3 Famous Engines: Cyclone, Whirlwind and Twin Wasp Jr.—including Detailed Plans and Text Instruction.**

Wylam's choice of subjects was made only after careful analysis and they represent the outstanding planes of each type. His notable collection in "SCALE MODELS by WYLAM" ranges from historic and popular models like the Fokker D-16 and "Winnie Mae" to present day war planes such as our Navy's Grumman F3F-2, England's Spitfire and Germany's Messerschmitt.

Although his layouts contain every conceivable detail of the original ship, they are simple to read and make construction of these replicas a fascinating hobby.

A particularly noteworthy achievement of Wylam, also found in this volume, is his exceptionally fine detailed drawings of the Cyclone, Whirlwind and Twin Wasp Jr. engines. They enable you to produce accurate replicas, which when installed on your models make them most realistic.

Model Airplane News is indeed proud to present this distinctive and enviable collection to all discriminating aeromodelers. Obtain your copy of "SCALE MODELS by WYLAM" and start your treasured collection now—just fill out the coupon below and mail it today. Price only $1.50 per copy.

MODEL AIRPLANE NEWS, 63
551 Fifth Avenue, New York, N. Y.

Enclosed find $1.50 for which please send me postpaid a copy of your new book "SCALE MODELS by WYLAM".

Name .....

Address .....

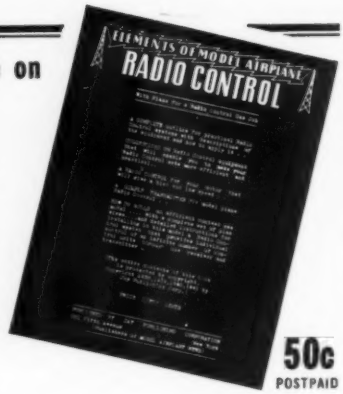
City ..... **State** .....

A Thorough and Approved Course on
RADIO FLIGHT!

YOU can now learn the fundamentals of Radio Control through the trial-and-error experiences of our nation's leading Radio Flight pioneers! It's all "boiled down" in this comprehensive treatise, which contains all the significant articles on the subject appearing in Model Airplane News magazine. Here you will find the latest authentic data on Radio Flight!

This Important Treatise Contains—

1. A complete outline for *best* practical Radio Control systems, with full description of the equipment and how to apply it.
2. Suggestions that will enable you to make your sets more efficient and practical.
3. A Radio Control for your motor that will give you a high and low speed.
4. A simple transmitter for model plane Radio Control.
5. Detailed instructions for building an efficient contest gas model (including a complete set of Plan Views!), and then installing in this model a Radio Control system that provides individual control of an infinite number of control units through one receiver and transmitter.



50c POSTPAID

28 Large Pages—Illustrated

Get acquainted with this fascinating, fast growing branch of model aeronautics by obtaining your copy of "Elements of Model Airplane Radio Control" TODAY. Send orders to:

MODEL AIRPLANE NEWS
551 Fifth Avenue New York, N.Y.

the takeoff platforms. In this part of the country I have attended meets where ROG had to be given up due to the fact that either wind had increased to such an extent it would be suicide to ROG, or the wind had shifted, therefore making it necessary to get an ax and lawnmower in order to clear enough ground to reset the takeoff platforms. Have you ever tried doing that, with perhaps 300 or more contestants waiting to fly their models?

"Mr. Foote admits we need a national organization, but says that the A.M.A. has failed, thus making it necessary for them to adopt their own rules in order to save the hobby from those nasty and ferocious dictators who have imposed upon us 'taxation without representation,' and ends his arguments by saying that he hopes to continue to work with the A.M.A."

As refereee of the Forum column, your editor wishes you to give consideration to several points which possibly have been overlooked.

First of all, during wartime it is absolutely necessary to restrict and control model flights and to restrain flights within certain definite limits of altitude and distance. This is not a "maybe" but a "must"—dictated not by some personality but by your government and the necessities of war. It remains a duty, then, of model builders, acting through the Academy, to provide rules that will insure this restriction. In other words, restraining the performance without restricting the construction or design, or specifying how performance must be obtained from some structural design. This must be left up to the ingenuity and inventive genius of our model builders, if dictation is to be avoided.

It is suggested that rules have some proviso that flights which transgress the requirements of war be termed "unofficial" and not eligible for prizes. A second offense might bring in addition the penalty of losing one's license or being excluded from future meets.

Model builders may wish to use their ingenuity in designing various forms of dethermalizers to fulfill requirements. This provides an interesting problem—something constructive. Limiting maximum flying time to 4 min., 5 min., or any number of minutes may be also a solution, provided it doesn't necessitate expert model builders being lowered to the class of beginners. Many beginners can fly 4 min. yet some expert modeler who flies 6 min. will be credited with much less than 4 min. Also on some days a model will disappear from sight of the field in 2 min.; under other conditions it may be in the air 30 min. and land again on the field close by. It would appear from this that a flight-time limit doesn't solve the problem but merely complicates it.

At any rate, many points should be considered if wise rules are to be established. Let us have your suggestions!

VICTORY

"Vee" for Victory

(Continued from page 13)

You will note the model features a demountable tail piece; shock, frequently incurred at this point, will then be appreciably reduced. Most important however is the fact that the builder can easily adjust his stabilizer setting, if necessary, by merely inserting slivers of wood between the tail piece and fuselage proper.

A slot will have to be cut out at the rear of the tail piece to receive the stabilizer. This is very exacting work. For appearance's sake the slot must fit neatly around the stabilizer. To dispense with any flight testing difficulties the builder would be wise to make absolutely certain the stabilizer incidence conforms exactly to the amount on the drawing. The same, of course, holds with the wing.

Landing gear is bent to shape and mounted to the front of the firewall as shown in Plate 1. The nose block and plug are then cemented to their indicated locations and the whole unit given five coats of heavy dope.

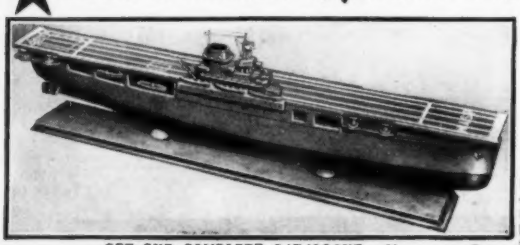
A radiantly mounted Forster 29 engine is used on the original. The air intake tube extends through the firewall into the fuselage. Access to the tank and carburetor assembly is gained through the trap door on top of the fuselage. The fuel drain, located below the tank, disposes of any fuel accidentally spilled into the fuselage while fueling. You will, of necessity, have to mount your engine inverted to obtain the low center of gravity position shown on Plate 1. It will also improve appearance and lessen drag.

A motor cowling is easily made of sheet aluminum; if unavailable, asbestos, fiber or some similar substance can be substituted. A cooling vent is cut in front and two smaller ones on each side. A study of the pictures will give you a good idea. Cowling is held on with pins stuck into the nose block and into the 3/16" sheet balsa former located at the top of the firewall above the engine.

Empennage construction is fully explained in Plate 1. Sand the fins to a streamlined crossection, and cement them well to each end rib in the position shown. It is vital that the stabilizer tip ribs be perfectly parallel to avoid any possibility of fins working against each other while in flight. Check this with a ruler.

The wing is made in two halves. Start off by first cutting out all wing ribs very accurately. They are then cemented at their relative positions to the 1/16" x 1/8" spars. Incline the butt ribs at a slight angle to allow for proper dihedral when both wing panels are later joined together. Trailing edge is appended next, making sure it is cut to the correct taper. The leading edge is cemented on last, so unpin the wing from your workbench and apply the 1/16" sheet balsa leading edge covering. This is done in the following manner:

★ Build a Perfect Replica of This Brave Ship! ★



MOULDED HULL INCLUDED, 18" LONG!

AIRCRAFT CARRIER WASP

COMPLETE CONSTRUCTION KIT

Includes everything needed to build an exact replica; our simplified parts and plans make it easy for anyone!

1.50 Postage 15c

GET OUR COMPLETE CATALOGUE. 10c

IDEAL AEROPLANE & SUPPLY CO., Inc., 20-24 West 19th St. NEW YORK

MODELCRAFT HEADLINER SOLID

"Old Boomerang"

LOCKHEED HUDSON BOMBER

IF YOU HAVEN'T GOT THIS ONE YOU'RE LACKING ONE OF THE WAR'S GREATEST FIGHTING BOMBERS

NEW COMPLETE DETAILED

¼" Scale Kit with large clear plans. Cut out or stamped parts in balsa-saving sugar pine which many modelers are coming to prefer.

$1.00 Add 15c Postage

One of the three really OUTSTANDING U. S. Bombers, the other two being the Fortress and the Mitchell (B 25). Modelcraft here completes its triumvirate of leading bombers with a super-solid of Lockheed's dependable HUDSON. Nicknamed "Old Boomerang" because of her habit of coming back, no matter how tough the mission.

Lockheed B-14 Hudson Bomber

NEW DE LUXE SERIES 60¢

Add 10c Postage

REPUBLIC P-47 "THUNDERBOLT"

The Army's newest favorite, now No. 1 U.S. Army fighter, 2000 h.p. engine. *Dives at more than 700 m.p.h.* Ceiling 40,000 ft. Known as the "Flying Battleship" because of its weight, armor, and outstanding fire power. In action in Africa and over Europe. ¼" to ft.

VOUGHT SIKORSKY "CORSAIR"

Terrific Navy fighter that has been in action all over the Solomons, New Guinea, and the Pacific generally. Its 2000 h.p. should give a little trouble to Jap Zeros with 800 h.p. Said to be the world's fastest single engine fighter, with a dead level speed of 500 m.p.h. ¼" to ft.

NEW STANDARD SERIES 35¢

Add 10c Postage

GRUMMAN F4F "WILDCAT"

Standard fighter on the Carriers. Gave protection to the Marines on Guadalcanal, and was important factor in victory at Midway. Fast and maneuverable. ¼" to ft.

DOUGLAS SBD3 "DAUNTLESS"

Dive bomber largely responsible for chasing Japs out of New Guinea. Carries 500 lb. bomb load beneath fuselage at speed of 300 m.p.h. Also used as scout. ¼" to ft.

M O D E L C R A F T

Largest Supply House in the West • 7306 South Vermont Avenue, Los Angeles, California

NOTE—We cannot accept Retail Orders for C. O. D. delivery.

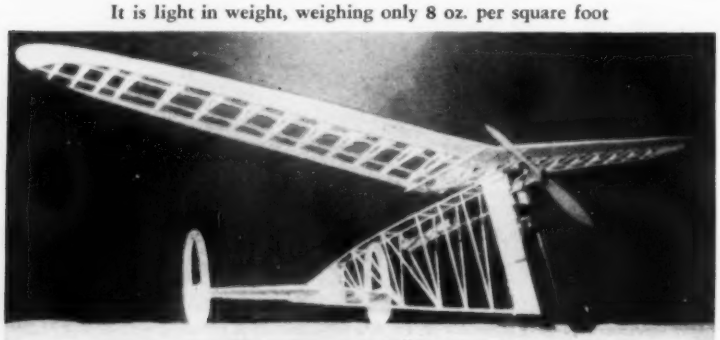
OK
Engines
Flying This Summer!
GOOD!
By all means 'keep your hand in' building and flying the gas jobs! Be prepared for the wondrous advances that will be ready after 'The Victory is Won!'
'O. K.' engine-making machinery is not idle! We're 'keeping our hand in' by round-the-clock production of vital war units —of most delicate precision!
It's a story in itself, to be told later!
—and we've many 'advances' to offer gas modellers! But that's another story, too!
In the meantime "KEEP 'EM FLYING!" and KEEP BUYING WAR BONDS and STAMPS!
Your dealer may still have an 'OK' from his last delivery! Inquire, on your next visit!
A SNAP
to Start!
HERKIMER TOOL & MODEL WORKS
Herkimer • • New York

First warp the sheet covering to the curve of the ribs by soaking it in hot water and holding it in position with pins and rubber bands. Be sure to leave about 1/4" extend past the front of the wing. Then, after the sheet has dried, it will have assumed the shape of that part of the airfoil curve to which it shall be attached. Glue the sheet covering to the ribs, and sand off the excess material, extending past the fore part of the wing, flush with the front of the ribs. Now all that remains is to add on the 3/16" x 1/2" leading edge and trim and sand it to the airfoil contour.

After both wing halves are made cement them together, and raise the tips to the required dihedral angle. Finish by smoothly sanding the whole assemblage.

Before starting to cover your model it would be very well advised to go over it again, check and eradicate any rough spots on the framework. The original "Vee" flaunts red gas model Silkspan on fuselage and stabilizer. The wing and fins use superfine tissue. Miscellaneous parts are trimmed with black dope. Cover in the usual manner and apply enough dope to gas and water-proof the model, especially in the vicinity of the fuel drain. Sand lightly with fine sandpaper in between coats.

It is light in weight, weighing only 8 oz. per square foot



The firewall and tail piece are held on with hooks and rubber bands. Strap the wing to the wing mount with rubber, and your "Vee" is finished.

Before trying a flight we would do well to check our model. The wing leading edge must be 13/32" higher than the trailing edge to provide positive 3 degrees incidence. The stabilizer is set at negative 2 degrees incidence; in this case the leading edge will have to be 3/16" lower than the trailing edge. These measurements are taken at the butt chords of both wing and stabilizer. Center of gravity location and alignment are checked next. The model is now in condition to function satisfactorily.

A calm day will, of course, greatly benefit your test flying—wait for one. A few test glides in tall grass should be made before attempting anything more daring. Proper balance is secured by shifting the wing back or forth until the model is gliding with flatness and stability. Confine incidence adjustments, if necessary, to the stabilizer alone. For your first powered flight fly the model under low throttle with a few seconds motor run. Observe the flight carefully, taking note of the model's peculiarities. It should circle to the left in a steady radius. If preliminary testing looks promising open up the motor by degrees, during subsequent flights, until full power is reached. If any need for adjustment arises regulate it accordingly. If built as presented, there is little doubt your model will be flying consistently with a readiness that is downright courteous.

VICTORY

Modeling Your Future in Aviation

(Continued from page 11)

During this procedure unquestionably there has been a great temptation to wind the propeller, but the wise modeler who wishes to obtain best flying results will refrain from flying his plane under power until it has been adjusted carefully for gliding.

There are two types of flight: gliding flight and power flight, and the adjustment of all models must be coordinated for both. So, it is necessary to make adjustments for each one separately. Gliding flight is simplest so it is given first consideration.

The second and next step now is to test the model under power and make adjustments if necessary. Very often a plane which has been properly designed in the first place and adjusted carefully for gliding will not need further adjustment for power flight.

Several steps are involved in power testing your model. The first may seem to be a fairly simple operation; that is, winding the propeller. However more than one plane has been damaged by clumsy inexpert fingers merely because they have not taken care to use proper technique. Consider Fig. 98; this illustrates the correct way to hold the plane with the left hand close to the propeller

bearing while you wind the propeller with the right. A right-hand propeller is illustrated: it is wound clockwise as indicated by the arrows. Now, to wind your plane, grasp the stick close to the bearing as illustrated, wind up the propeller carefully and slowly at first with the right hand. Holding the stick close to the propeller prevents wabbling when extreme tension is put on the motor. If the stick is grasped far back winding will be very difficult.

The motor of your little plane when fully wound for the first time will absorb 400 turns, if 4 strands are used and 325 if 6 strands are used. However on the first flight the motor is never completely wound; this is not only bad for the motor but any mal-adjustment of wing surfaces will be magnified many times during flight under high power and often results in a crash and damaged plane. Wind your propeller about 1/3 the maximum turns the motor will withstand; about 130 for 4 strands and 110 for 6.

Under power any wind that might be blowing has more effect upon the plane under power than when gliding, so when the plane is wound for its first test, note carefully the direction of the wind because a successful launching often depends upon this factor. Best results are obtained when the model is launched slightly to the left of the wind direction, approximately 10 degrees. Sometimes when models are launched directly into the wind they will loop instead of circling and leveling off at the top of the initial climb. A loop under full power often ends in disaster. Some builders prefer to launch the model slightly to the right of the wind direction but the standard course is to the left. After more experience is gained you will find that some models operate most successfully one way and some the other.

After determining the launching direction grasp the model by the frame stick with the right hand close to the front of the wing, holding the propeller with the left so it will not unwind. Then raise the plane to about the level of your eye or top of your head *with the frame stick horizontal*. This is the correct launching position illustrated in Fig. 99. Nine out of every ten beginners are possessed with the idea that they must launch the model upward. This is a vital mistake and usually results in a smashed airplane. So proceed cautiously and take the greatest care that your model is launched in the position illustrated in the figure.

Now you are ready for a thrilling moment and possibly your knees are just a little shaky from anticipating the results of your many hours of labor. Nevertheless "pull yourself together" and proceed carefully. Do not throw the model, first release the propeller allowing it to spin freely, then toss it gently forward on a horizontal line indicated by the arrow in the figure. The launching velocity for power flight, like gliding flight, must be approximately the normal flight speed of the airplane. Often less launching speed is required for power flying than gliding, because the power of the plane will pull it into normal flight. Do not merely drop the plane, however; it must have an initial start when launched by hand. After a few trials, you will find launching a simple matter.

Be sure that while you are holding it in the position shown in the figure the propeller is released before the plane is tossed forward into flight. Do not try to release the propeller and toss the plane simultaneously, at least not until you have become an expert.

Now if you have followed directions the plane will be started on its way. First it will fly level and then will climb slowly until power in the rubber motor is diminished. Then the plane will gradually level off, fly a short distance until the power is spent, and then glide to the ground. At least this is what the plane should do if properly adjusted. With the motor only 1/3 wound the flight probably will not be very long because the ship will not have obtained much altitude.

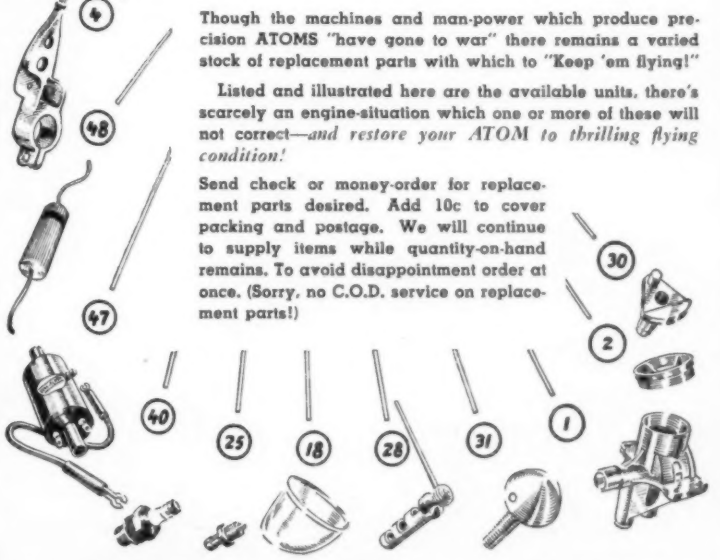
Due to the propeller torque you can

AVAILABLE

Though the machines and man-power which produce precision ATOMS "have gone to war" there remains a varied stock of replacement parts with which to "Keep 'em flying!"

Listed and illustrated here are the available units, there's scarcely an engine-situation which one or more of these will not correct—*and restore your ATOM to thrilling flying condition!*

Send check or money-order for replacement parts desired. Add 10c to cover packing and postage. We will continue to supply items while quantity-on-hand remains. To avoid disappointment order at once. (Sorry, no C.O.D. service on replacement parts!)



15—TIMER MAIN SPRING, 10c
11—MOVING CONTACT POINT 35c
14—RIDER BAR 25c
7—FIXED CONTACT POINT & NUT 40c
4—TIMER BRACKET CASTING $1.25
4a—TIMER, COMPLETE ASSEMBLY $2.75
48—CONDENSER ..... .20
47—DYNA-FLASH COIL 1.75
40—V-3 SPARK PLUG & GASKET ..... .50
25—ATOMIZER ..... .50
18—STREAMLINED GAS TANK ..... .30
28—THROTTLE VALVE, COMPLETE $0.60
31—NEW, 2 PIECE HUB SHAFT ..... .50
1—CRANK CASE, WITH BEARING .. 2.50
2—CRANK CASE COVER .35
30—CRANK SHAFT 2.75

MICRODYNE ENGINES

GENERAL POST OFFICE BOX 245, N. Y. C.

Latest Developments in

RADIO CONTROL

A booklet written for the radio control beginner as well as the expert. Features—"The theory of the RK-62 receiver"—"Control devices"—Table of A and B batteries—A comparison of the electrical and mechanical qualities of bakelite, steatite and polystyrene—Self-neutralizing escapement—sequence solenoid—rubber powered selector—rubber powered indicator—"Radio Control Circuits," an article written in answer to the questions asked in the thousands of letters received by us. Eighteen different radio control hook-ups with hook-up diagrams.

Ask your dealer or send twenty-five cents for Illustrated Instruction Manual. Stamps will not be accepted.

Radio Control Headquarters
P. O. Box 214 Deal, New Jersey

DEALERS!

DON'T BUY

—until you get our "lowest-ever" complete wholesale price list first. Bigger profits on all gas motors, gas and rubber-powered kits and supplies. Write for large wholesale catalog today.

MONTAUK MODEL AIRCRAFT CO.
4320 Sixteenth Ave., Dept. M-6, Brooklyn, N. Y.

SUPER CYCLONE OWNERS ATTENTION!

We have only 150 more replacement crankcases for G. or G.R. Series. More R.P.M.S. Guaranteed—**$4.75 P.P.**

Cyclone Case Rebushed.....$2.50
Atwood Case Rebushed.....$2.50
Bunch Case Rebushed.....$1.75

Largest Stock of Guaranteed Rebuilt Motors on the Coast. Send 3c for List. **$6.95 up.**

Let us rebuild your Engine for new Life and Power for the Duration.

We carry a complete Line of Parts for All make Engines—New—Used—and Rebuilt. Special parts to order at Reasonable Prices.

WANTED! Used Motors and Parts—All Makes. Regardless of Condition, especially Super Cyclone—Hornets and Tigers.

Send Your Motor To Us for Estimate Now!

ACT TODAY! We will pay *top* prices Regardless!

PRECISION PARTS and SERVICE
60 W. 53rd St. Long Beach, Calif.

AIRPLANE INSIGNIA

DECALS ALSO NEW OFFICIAL HIGH SCHOOL VICTORY CORPS INSIGNIA DECALS

Get bright COLOR Squadron Insignias! Authentic, official designs of U.S. Air Corps. Lively, attractive, Genuine Decals. Soak 'Em —Slide 'Em—Stick 'Em for permanent wear. 6 pairs (12 decals) 1" size, 12 for 10c. Also comes in 1½" size, 12 for 15c. 50 assorted sheets of 12 decals of each size. Send coin, no stamps. FREE —A large V for Victory color decal 7½" x 11" given with each order of $2.50 or more. Illustrated literature upon request.
RED CHIEF INDUSTRIES
Dept. MA-6
2326 S. Michigan Ave., Chicago, Ill.

expect the plane to make a left circle. This may be gradual, not necessarily a sharp one, unless the wind is strong and, if this is the case, test flights should not even be attempted. The course of flight considered in a straight line should appear as line A in Fig. 100. If your first flight is normal then more power should be used on succeeding flights, gradually increasing the number of turns to a maximum after 5 or 6 perfect flights. It is suggested that you half-wind the motor for the second flight. However if the first flight is not perfect, indicating correct adjustment, do not increase the number of turns in the motor on the succeeding flights; be sure to obtain a perfect flight before any such increase.

We have been looking upon the optimistic side, but possible errors must be considered. Suppose your plane followed the course B indicated in Fig. 100. Such a flight would indicate two possibilities: 1st. that the launching speed was excessive and you tried to gain altitude by throwing the model too hard rather than letting the power do the work. 2nd. the wing may have been too far forward. If you are not certain which of these caused the trouble try another flight, being sure to launch it properly.

Then if it follows course B look carefully at your stabilizer. After adjusting the wing for a glide such a course would only result if the stabilizer was curved upward at its trailing edge. Curve the trailing edge slightly downward by the method used to warp the wings; that is, heating it in the palm of your hands and twisting the edge down at the same time. Only a slight correction is needed to obtain considerable flight effect, so do not over-correct.

Now try your plane again. If it follows normal course A no further adjustments are required. If it follows course D you have over-corrected the model and the stabilizer trailing edge should be curved slightly upward. If the plane flies properly under power but glides steeply at the end of the flight it is an indication that the small elevation block cemented to the center of the wing at the trailing edge is too thick, giving the wing too much angle of incidence. A steep or normal climb and a steep glide is a certain indication of this condition. If necessary make this correction and test your model again. After such a correction you will probably obtain type of flight D if the wing is not moved forward 1/4"; nevertheless test it first before moving the wing. If your test indicates flight D then move the wing 1/4" forward which will result in flight A.

If the plane follows course C upon your first test and the stabilizer and wing angle of incidence are correct, the wing is too far forward and should be moved back 1/4" for correct adjustment, resulting in flight A.

After a number of trials it will be obvious that moving the wing forward, point A to D Fig. 95, induces greater climb; moving the wing back, point A to C, gives less climb or causes the model to dive. The *degree* of climb or dive is regulated by the *amount* of movement.

If the wing doesn't react to the wing adjustments as indicated here you can be certain the cause lies either in the fin, stabilizer, or that the wing is warped. In such a case it is necessary to check your whole plane for correct design setup. That is, 1. Make certain the fin is straight and parallel with the axis of the motor, not turned one way or the other. If turned it would have the effect of a rudder, causing a sharp circular flight. 2. Check the stabilizer, correcting any curvature or angular deviation. It should be parallel with the motor axis or thrust line. 3. Check the wing angle of incidence, determining whether or not the incidence block is the proper thickness, 1/8". 4. Check the wing for warp as explained previously. In some cases a curved motor stick will cause improper stabilizer or fin angles. Make certain that the stick is straight; correcting any curvature by bending when heated.

Now it is assumed that your plane is adjusted for normal flight and performing satisfactorily. You without doubt will have many thrills from this type of flight; however it is necessary to understand how to control the plane, how to make it circle one way or the other, climb, dive or perform other maneuvers.

Right or left circle can be produced by bending the trailing edge of the fin to right or left. This operates in a manner similar to a boat, and usually only slight deviation is necessary to obtain results. You will notice probably however that the plane doesn't climb as steeply when circling under rudder as when making a normal flight. This is due to a fundamental fact: on turns the nose of an airplane drops slightly. So, if in circle-flying proper flight is not obtained move the wing forward 1/8" to 1/4" as required to obtain the desired degree of climb. A left circle with propeller torque usually proves most satisfactory; the plane doesn't respond to right rudder against torque as readily, and often causes extreme diving tendencies due to propeller gyroscopic effect. Unless otherwise necessary left turns are always advisable.

A steep left spiral can be obtained by using maximum power, left rudder and placing the wing well forward. In some cases no left rudder is required for such a maneuver as normal propeller torque causes left circle.

Loops may be performed by moving the wing well forward, 1/2" to 3/4", and adding power to the motor. When there is too little power an attempted loop will result merely in a steep stall and resulting dive.

After your first afternoon's flying unquestionably your respect for model flying and fliers will have risen 1000%, for it will have become obvious that principles of control of large planes are completely embodied in models—the model having the advantage that control principles can be cheaply and easily demonstrated. With proper adjustments all sorts of maneuvers can be carried out and you will find it extremely fascinating to follow a precise course of study with your test model, learning the adjustment and flight technique for the various maneuvers. There is no better way to learn to fly large ships than to start your training with this procedure.

When you have made 50 or more flights

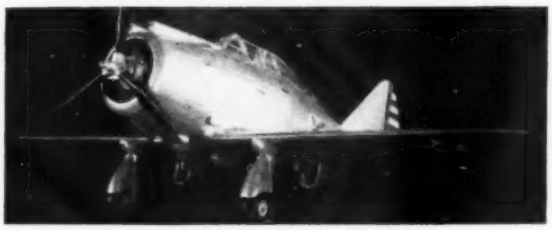
GRUMMAN F3F1

U. S. NAVY SHIPBOARD FIGHTER

32" Span. Length 24". 1" Scale

A fine detailed model with retractable landing gear, 4" turned motor front, 3 oz. grey dope, ½ oz. yellow, 2 oz. glue etc., all parts printed, 10" propeller, wheels, full size drawing, and all parts. This fighter plane is used in large numbers on the aircraft carriers. Const. Set complete, postpaid..... **$3.75**

SEVERSKY P35A ARMY PURSUIT

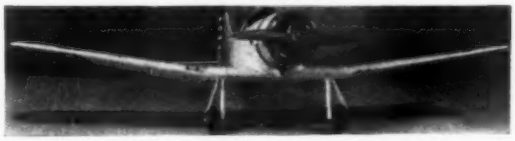


32" Span. Length 25". 1" Scale. Color, Silver

Set has 4" turned motor front, 10" carved prop, wheels, tail wheel, all parts printed, 3 oz. silver dope, ½ oz. black, 2 oz. glue, etc., insignia, and full size scale drawing. New improved model has retractable landing gear and movable controls from cockpit. Set, postpaid..... **$3.25**

DOUGLAS SDB DIVE BOMBER

Scale Gas Model



48" Span. Length 33". Class "B". Motor Driven

A real steady flying scale model with plenty of wing dihedral for stability. Get the thrill of flying a real fighter gas model. Const. set, complete with full size plans, postpaid..... **$7.50**

NEW MARTIN B26 U. S. ARMY BOMBER

40" Span. Length 35". ⅛" Scale. Color Silver

A beautiful model of the world's fastest bomber. Set has all parts printed, propellers, wheels, insignia, 4 oz. silver paint, 1 oz. black, motor fronts full size scale drawing, and all parts to build. Construction set, postpaid..... **$4.75**

Thousands of this type of plane are fighting for the U. S. and Britain

BOEING B-17 FLYING FORTRESS BOMBER

44" Span. Length 30". Color Silver. Weight 6 oz.

THE MOST SENSATIONAL EXCLUSIVE BOMBER SET IN THE WORLD

Set has all parts printed, four 2" special finished motor fronts, four carved props, wheels, set of paints, glue, and full size drawing. Set, postpaid..... **$4.50**

CURTISS HAWK F11C4 PURSUIT NAVY

32½" Span. Length 22¾". 1" Scale. Weight 6 oz. Color grey, top wing yellow

THE MOST EXCLUSIVE AND FINEST EQUIPPED MODEL IN THE WORLD. MOVEABLE CONTROLS WORK FROM COCKPIT. A special de luxe model, one of the most beautiful ever made. Set contains a 4½" scale Wright Cyclone celluloid motor, detailed push rods, fins, etc., like real motor, 4½" aluminum cowl, 10" steel type carved prop shown, 2⅛" wheels, tail wheel, star and rudder insignia and lettering, windshield, instrument board, flying wires, 4 aluminum step plates, aluminum wing walks, ready cut wheel pants, washers, 3 oz. grey paint, ½ oz. yellow, ½ oz. red, 2 oz. glue, etc. All other parts are printed 33"x44" scale drawing. Const. set, complete in labeled box, postpaid..... **$4.50**

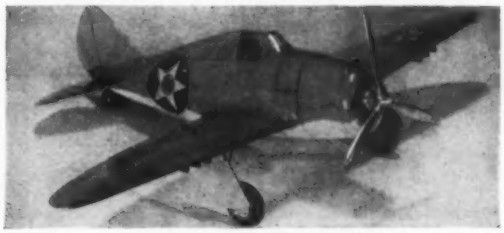
TWO NEW READY BUILT SOLID MODELS

NEW CURTISS P40F WARHAWK SOLID

14" Span. Length 11¾". ⅜" Scale

Ready built masterpiece solid model, beautifully finished. Cast prop. Postpaid..... **$17.00**

REPUBLIC P43 LANCER SOLID



14" Span. Length 10½". ⅜" Scale

Ready built masterpiece solid model, beautifully finished. Cast motor and prop. Postpaid..... **$16.00**

NEW CATALOG

Large 6" photos of latest models. New Catalog No. 9
Send 10c coin

ORDERING INSTRUCTIONS

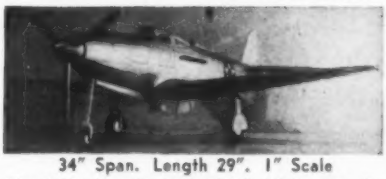
Orders sent west of Mississippi, add 15c postage—Foreign, 20c.

BOEING F4B4 NAVY FIGHTER

22½" Span. Length 14½". ¾" Scale

Set has 3" celluloid motor, 3¼" tapered aluminum cowl ring, set of paints, all parts printed on balsa, drawing, etc. Set, postpaid..... **$2.95**

BELL P39 AIRACOBRA U. S. ARMY FIGHTER



34" Span. Length 29". 1" Scale

New fighter to scale, parts printed, paints, glue, etc., wheels and all parts. Postpaid..... **$3.50**

MINIATURE AIRCRAFT CORP.

83 DANIEL LOW TERRACE
STATEN ISLAND, N. Y.

with your first test model you will have probably learned all its "tricks" and will have an intimate conception of its flying qualities. If not, fly the model until you understand it thoroughly, for all future tests will be based upon the flight of this model as standard. In our experiments throughout this series of articles, models with modified design features will be tested systematically and their performances compared with the standard model given here. Unquestionably you will find it an advantage to write up a diary or record of these experiments, making notes concerning the type of flights, corrections required, correct setting of the wing relative to the c.g. (point A, Fig. 95), etc. They will prove extremely useful when test flying new designs.

VICTORY

Flying Models Under Water

(Continued from page 17)

sary at first to get the correct balance. A square or round hole is generally bored or chiseled on the bottom of the fuselage of the solid model. A number of small lead weights and corks are cut to fit into this cavity; these corks and lead weights are juggled around until the correct balance is obtained.

Corks are useful for this as they act as fillers to hold the weights in place. After the correct balance is found, a metal cover is placed over the hole to cut down drag, or it may be covered by plastic wood and sealed.

When carefully balanced, press metal cover in place to prevent drag

In adjusting the weights in a glider, work for a long slow glide; the glider must not bob to the surface as soon as it is released. This would indicate that not enough weight was used and that it was not correctly placed. Sometimes it is necessary to bore a small hole in the nose of glider and add weights here to get the best performance. You won't get it right the first time but stick to it.

Another stunt used by Leash to adjust the weights was a small threaded brass rod in the fuselage with a small weight threaded to fit the rod. A close adjustment is easily made with this. Of course if you want something simple to make, try the corks and pieces of lead first.

In the case of rubber powered models a hole is bored from one end of the fuselage to the other, large enough to admit the rubber you intend to use, or a slot may be made in the fuselage top or bottom and sealed over after the rubber had been installed. Be sure to cover this slot to cut down drag.

Placement and adjustment of the body weights in a rubber powered model is much the same as with the gliders, only powered models are generally "over-weighted" to the extent that they slowly sink after the power is exhausted; while the gliders are "under-weighted" just enough to give them buoyancy enough to return slowly to the surface after a glide.

Movable tail surfaces and ailerons are very desirable on powered models. It is amusing to watch one circle or wing-over in slow motion. Wind it up and release it just beneath the surface in a vertical stall and watch it "come out of it" and circle back to you.

A swimming pool is ideal to "fly" your models in, if the water is clear, but a lake or stream will answer the purpose if the water is not too swift. Dig out some of those beautiful scale models and put them through their paces. It's a good way to enjoy the hot weather, keep cool, and keep 'em flying.

VICTORY

Austin-Craft

ACCESSORY GUIDE

SPECIAL . . . .

"HI-O" ALL-METAL GAS TANK

A new *metal* tank kit for the "hot" fuels in vogue today. Contains 1¾ oz. tin tank, 2 tin mounts, neoprene filler tube, and copper intake tube. Can be assembled in 10 min. Austin-Craft again provides the latest in accessories for U-Control, gas models, boats, and cars. At dealers, or direct *(postpaid)*..... 50c

FINER . . . .

4-WAY SPARK PLUG WRENCH

This new Austin-Craft plug wrench removes ANY type plug without damage to cylinder head fins, or modeler's disposition. Combines several wrenches in one. Made of durable 1/16" by 7/8" steel with extruding hex openings, correctly sized. Get *yours* while they last..... 35c

By mail, add 5c postage

AUSTIN-CRAFT CO. 431 SOUTH VICTORY BOULEVARD, BURBANK, CALIFORNIA (2)

Gentlemen:

☐ Hi-O Gas Tank 50c ☐ 4-Way Plug Wrench 35c ☐ Austin-Craft Catalog 10c

Name.....

Address.....

City..... State.....

Super Spitfire

(Continued from page 23)

was born, for the lineal predecessor of this famed airplane began to take form in the mind of Mr. R. J. Mitchell.

The 1922 contest was held at Naples and the Supermarine Mk. II, a flyingboat of not ungainly line won the trophy with an average speed of 146 mph (compared with the 110 mph speed of the well-known Sopwith Camel, circa 1917-1922) flown by Henri Baird. The United States entered the picture the following year; the U.S. Navy commissioned Curtiss to build an entrant and, coincidently, the famed Curtiss Hawk was born.

The 1923 Trophy came to the U.S., for the resulting Curtiss machine, with Lt. David Rittenhouse at the controls, won the race at an average speed of 177.2 mph. The Supermarine entrant was a modification of the Mk. II, and the race, held at Cowes, Eng., proved to Mitchell that a radical change in design-thought must be made to insure an eventual British victory. To laymen this does not seem a task, but to an engineer who learns he must completely revise his lifelong principles of design, it is torture. From designing flyingboat hulls, Mitchell swung to thin fuselage; from pusher propeller installations (used on the previous two racers) he went to tractor; from biplane he went to monoplane and to twin floats. Results of this mental re-birth was the Supermarine S-4, an all-wood low-wing monoplane seaplane powered by a Napier Lion twelve-cylinder, water-cooled engine.

There was no contest in 1924; the 1925 races were held at Baltimore, Md. Prior to shipping the S-4 to America in the Spring of 1925, Henri Baird ran several trials over Southampton Water and succeeded in establishing a new world's airplane speed record of 226.75 mph. The American entrant was another Curtiss Racer, R-3, and a new Italian Macchi competed in addition to others. During a trial flight in Baltimore, the Supermarine S-4 developed wing flutter, a subject about which very little was known at the time, and was completely demolished in a crash, Captain Baird escaping unhurt. In the trophy races, America was, again, crowned the winner with the Curtiss clocking an average speed of 232.57 mph, a new world's record, piloted by famed Jimmy Doolittle, now Major General, in charge of long-range bombing operations on the staff of Lt. General Carl Spaatz in Tunisia.

For the next (1927) Schneider Trophy Contest Mr. Mitchell designed a very thin metal wing which was braced with streamlined flying wires to the floats. This machine, the S-5, was powered with the Napier engine, now increased in horsepower. The 1927 contest was won by this machine, piloted by Flight Lieutenant Webster, at an average speed of 281.54 mph. A second S-5 placed second at 273.07 mph.

For the 1929 contest Mitchell made use of the new Rolls-Royce "R" engine (father of the famed Merlin), a twelve-cylinder, liquid-cooled "V" design with a maximum of 2,000 hp. available. The S-6 was therefore larger than earlier racers, and was full cantilever with surface radiators. The 1929 Schneider was won by the S-6 piloted by Flight Officer Waghorn, at an average speed of 328.6 mph. (The United States abandoned racing following the 1925 Schneider and the American Pulitzer-landplane-contest.) This same S-6 later established a new world's record at 357.7 mph. in addition to setting records for 50 and 100 kilometers distances.

The S-6 was modified for the 1931 Schneider, a thinner, wire-braced wing used and special Rolls-Royce engine fitted. This engine actually developed 2,300 brake hp. at a weight of 1,630 pounds! The S-6B, best known of the series, was fitted with surface radiators along the fuselage, wings and even on the floats. In this machine, Fl. Lt. Boothman averaged 340 mph. to win for England perpetual possession of the Schneider Trophy. This machine raised the world's record for 100 kilometres to 342.7 mph. and, on the same day of the trophy race, another S-6B established a new world's speed record of 379.05 mph. On September 29th, 1931, an S-6B fitted with a special racing version of the Rolls-Royce engine, established a new world's speed record of 407.5 mph. (The present world's seaplane speed record is 440-67 mph. set by Lt. Francesco Agello in a Macchi-Castoldi 72 which was a direct development of the Schneider Trophy Macchi machines representing Italy. This record was set on October 23rd, 1934, and the engine, Fiat A.S.-6, developed 3,000 hp.! The present World's Absolute Speed Record (any type of vehicle) is 469.225 mph. set by Flugkapitan Fritz Wendel in a German Messerschmitt 109 special racing version of the fighter on April 26th, 1939).

Some might ask (some have even *stated*) why not simply add a wheel landing gear to the Supermarine S-6B and have the world's fastest landplane and perhaps have a Spitfire by adding armament? It's not quite that simple. First off, the big Rolls-Royce was designed specifically for "short burst" power and had an enormous fuel consumption. (The S-6B carried fuel in the floats!) The radiator tubes covering the surfaces would be highly vulnerable and the thin racing wing used would be near-useless because of its weakness and because of the extremely high (120 miles per hour) landing speeds involved. However, when the British Air Ministry issued Fighter Specification F36/34, the Supermarine engineers (which had been absorbed by Vickers, Ltd., in September, 1928) were ready with a wealth of experience in high-speed

PLANE TALK **SKYWAY** FUN WITH A FUTURE! **FREE** POSTAGE ON ALL U. S. A. ORDERS

BALSA 18" Strips SELECT, HARD STOCK

1/16 sq.....15, 5c
1/16x1/2 10 for 5c
1/16 x 3/16 8, 5c
1/16x1/4 5 for 5c
3/32 sq. 10, 5c
1/8 sq. 10 for 5c
1/8x3/16 7 for 5c
1/8x1/4 5 for 5c
5/16 sq. 5 for 5c
1/4 sq. 4 for 5c
1/4x1/2 2 for 5c

18" Balsa Sheets
1/64x11/2 5 for 10c
1/32x11/2 6 for 10c
1/16x11/2 5 for 10c
3/32x11/2 4 for 10c
1/8x11/2 3 for 10c
3/16x11/2 3 for 10c
1/4x11/2 2 for 12c
1/2x11/2 ea. 8c
3" & 36" cost twice 18"; 3x36, 5 times.

NOSE BLOCKS
1x2x1 .....1c
2x2x1 .....2c
2x2 1/2x1 .....3c
3x3x1 .....4c
3x3x2 .....8c
3x3x3 .....10c
5x5x2 .....17c

MACHINE GUNS
3/4"....3c, 1 1/4"....5c
1 1/4" Lewis....6c
1 5/8" Lewis....8c
1 1/4" Ring Mt. 15c
1 5/8" Ring Mt. 20c

BOMBS
3/4" .....each 3c
1 1/4" .....2 for 11c
3" Torpedo 15c

AA TISSUE
Ass't cols., dz. 35c
Silver .....ea. 5c
Superailk, wh. 5c

Gas Model BAMBOO PAPER—Yellow, blue, white.....3 for 25c

RUBBER Power Accessories
Model Pins 1/2".....50 for 5c
Sheet Celluloid 5x7 5c, 14x17 20c
Ball Bearing Washer, 5/16"or7/16" 10c
Sandpaper, 2 sheets, 12"x12".....5c
Lilliput Lights—3 lamps, wired, instruction sheet, Per set....90c
Insignias, Four colors, 36 ass'd Amer., French, English, German, gummed, per sheet.....5c
Colored decal-squadron insignias, 6 pair per sheet, 10 COUNTRIES! 1" dia..10c; 1 1/2" dia. 15c
Washers, 1/4 Pinhole.....doz. 5c
Prop Shafts, doz. sm. 6c, lge....10c
Nose Plugsfor5c, 1/2"—3, 3/4"—4, 1"—3.

Note: If war regulations make it necessary, we reserve the right to make substitutions.

SKYWAY'S ALL METAL MODELERS' KNIFE 10c

6" TIP-TO TIP! Can't Slip

WHY PAY MORE? THE EQUAL OF ANY 50c or $1 KNIFE!

Easiest-to-work-with! Safest! Equally efficient on delicate or heavy-duty projects! Refills in a jiffy! At dealers knife with double edge blade 10c. (By mail: 15c). Extra blades 2 for 10c; Knife with blade plus 2 extra blades 25c postpaid.

Keep Building :: Keep Saving :: Keep Flying!

5 FOOT BALSA (Minimum $1)
1/32x1/2 .....6 25c
1/32x3/16 .....5 25c
1/8x1/4 .....4 25c
3/16 sq. 4 25c
1/4 sq. 3 25c
1/4x1/2 .....2 25c
3/8 sq. .....ea. 15c
1/2 sq. .....ea. 20c
Sheets, 5 times 1"

16" Balsa Planks
1/2x1/2 ....3 for 10c
1x1 .....10c
1x2 .....20c
2x2 .....30c
2x3 .....50c
2x6 .....95c
3x6 .....1.50

Celluloid Radial MOTORS
1 1/4" 10c, 2" 15c
2 1/2" 20c, 3" 25c

SPRAY GUNS
Large Size.....2
Jars $1.25

Thrust Bearings
1/2 doz. Sm. 8c
1/2 doz. Lge. 12c

SILKSP'N, white only; Gas Model 3 for 25c; Rubber Power, sheet....5c

Free Postage ON ALL U.S.A. ORDERS

SHIPPING INSTRUCTIONS: Add 5c for insurance to assure safe delivery. Packing cost on all orders 10c. 36" or 5 ft. 20c. If outside 48 States also add 15c postage when order is over $1 and 15c if under $1. Minimum order—50c. No. C.O.D.

30" RUBBER KITS 65c (ea.) Douglas Devastator, Supermarine Spitfire, North American Mustang, Curtiss Warhawk, Grumman Wildcat.

DE LUXE SOLIDS $2.50 Carved Fuselage in each. Bell, P-40, Ryan S T M-2, Grumman F3F3, Lockheed $3, Stuka $3, Whirlwind $3.

MODEL AIRPLANE DESIGN by C. H. GRANT, Editor M.A.N.

New Edition, 328 pages, 205 diagrams & plans. Basic trainer for Aviation Career. Shows how to produce consistently fine, flying models.....**$3.75**

TRAINING COCKPIT $1 PRE-FLIGHT PILOT COURSE

Full size instrument panel with movable dials, full size "joy" stick for control manipulations; complete Kit includes 30 page illustrated instruction book and instructions for plane identification. (BY MAIL: Add 3 pounds postage to your zone!)

CEMENT
CLEAR DOPE THINNER
Banana Oil
1 oz. 8c, 2 oz. 15c
1/2 pt. 40c, pt. 65c

Colored Dope
1 oz. 8c, 2oz. 15c
1/2 pt. 50c, pt. 75c

MICROFILM RUBBER LUBE WOOD FILLER LIQ. CELLULOID
1 oz. 9c 2 oz. 15c
1/2 pt. 50c, pt. 75c

Dowels
1/16"x12" .....
1/8"x18" 2 for 5c
3/16"x18" ea. 5c
1/4"x18" ..... each 5c

12" Bamboo
1/16"x1/4" .....
..... 4 for 5c
Reed, 3 ft. lengths
1/32-1/16-1/8
.....ea. 5c

Brass Bushings
1/16" or 1/8"
.....doz. 5c
Gas model 6 for 5c

GAS MODEL ACCESSORIES
Champion Spark Plugs 3/8 or 1/4 50c
Plugs & Jacks, per set.....35c
Battery Boxes, Sm. Med. 40c
Motor Mts. Sm. 15c; Med. 40c; Lge. 60c
Condensers, best qual. 20c; Metal 35c
Terminal Clips 5/8" 10c val. 2— 5c
Spaghetti Tubing 1/16" 3 ft.—10c
Toggle Switch 35c. Lightweight 25c
SAE 70 oil—1/2 pt. 25c. Pint....45c
12" High Tension Leads—Best ...15c
Best Quality H.T. leadwire, 3 ft...10c
Booster Leads, 75c value, pair...50c
Solid DURAL Spinner, Small, Lge. 25c
Masking tape—1/4"x36"—Instruc. 5c
Alligator Clips—Solderless.....10c
Jiffy Switches, stops power dives 39c
Neoprene tubing per foot.....20c
Plywood—1/16, 1/8, 3/16, 1/4...40c ft.

CAMOUFLAGE KITS 9 bottles varied camouflage colors with instruction booklet. **$1**
(By mail: Add 3 pounds postage to your zone)

Trexler Wheels
1 3/4, 2—55c
2 1/4, 2 5/8—66c
Gas Mod. 2 3/4-1.10
3-1.40—3 1/2-1.65
4 1/2-1.95

M&M WHEELS
1 3/4, 2 2 5/8 70c
Gas Mod. 2 3/4 $1
Flyweight " 85c

STREAMLINE Sponge Rubber Wheels (per pair)
2" 40c; 2 1/2" 50c; 3 1/2" 60c.

PROPELLERS
Balsa Paulo Ritz Wing Gas
5" 4c-10c Mod.
6" 5c-10c 8" 40c
7" 6c-15c 9" 40c
8" 7c-17c10" 40c
9" 8c-21c11" 40c
10" 9c-25c12" 40c
12" 10c-30c13" 40c
14" 12c-50c14" 40c
15" 15c-60c15" 50c
16" 16c-75c16" 50c
18" 25c1.25 18" 75c

RITZ-Gumwood
8"9"10"11" 20c ea.
12"13"14" 20c ea.

PROPELLER BLOCKS
1/2x 3/4x 5 4—5c
1/2x 3/4x 6 3—5c
3/4x1 x 8 2—5c
3/4x1 1/2x10 5c ea.
3/4x1 1/4x12 4c ea.
1 x1 1/2x12 6c ea.
1 x1 1/2x15 9c ea.

DIE CAST PROPS
2 Blade 3 Blade
1 1/2"-2" 5c— 6c
2 1/4" 7c—10c
2 3/4-3 1/2" 10c—15c
4 " 20c—25c

Gas Model Silk
H'vy qual. 75c yd.

BROWN RUB'R Bands 1/8x8" ea. 2c

ALUM. TUB'G per ft.
1/16 .....10c
3/32, 1/8 .....10c
3/16, 1/4 .....15c

Sheet Alum. 1/2 ft.
.003-.005 ....25c
.010 .....35c
1/16...6x6 .....35c
Alum. Dural Angle
1/2x1/2 ft. 20c
3/4x3/4 .....30c

Alum. Foil 6" Roll 6" wide
Perfect for covering metal surface of plane, etc. 15c

TIMERS
Austin $1.50
Dural 1.95
Hillcrest .. 1.25

COILS
SKYWAY....$1.00
Smith 3 V...$2.75
Superlite $1.75
Aero-Coil $2.25

CAMEL'S HAIR BRUSHES
Med. Sc. Lge. 10c
Gas Mod. 25c

MUSIC WIRE
.014 .....3 ft. 2c
.020 .028 3 ft. 3c
.034 .040 3 ft. 4c
.049 .....3 ft. 5c
1/16"....3 ft. 6c
3/32"....2 ft. 10c
1/8" .....3 ft. 15c

'U' CONTROL WIRE on special 100' 65c; 50' 40c

Wing-Tail Light (Set of 3) 5/16 8c 9/1610c, 11/1612c

Spinner Type
1".....5c; 2" 10c
3" oversize....20c

SKYWAY MODEL AIRCRAFT SUPPLY CO., 426 SIXTH AVE., DEPT. M. BROOKLYN, N. Y.

Until Peace Returns---

the precision and skill acquired and required in building FORSTER motors is now put to its highest test and use.

Quietly, without beating our chests, we have long ago turned our manufacturing facilities and experience to producing war products, - - Precision Engine Parts that go into giant war monsters!

When peace again returns, we will be among the first to return to our prewar work and bring you even better motors than you have known "FORSTERS" to be in the past.

In the meantime, keep your FORSTER motor flying! Repair parts and repair service is available at the factory as long as our stocks last. Send your motor in for quick, expert service at low cost.

FORSTER BROTHERS

1415 Lake Street — Melrose Park, Illinois

design and R. J. Mitchell had the first experimental prototype completed in the Spring of 1936. The first flight was made in March, 1936, by Mr. J. Summers and the machine was officially demonstrated to the Royal Air Force in June, 1936, at Eastleigh, Southampton by Mr. J. K. Quill. The machine was equipped with a newer and smaller Rolls-Royce engine and the first flight nearly ended in disaster when the oil system failed in the air and only Mr. Quill's masterful handling brought the plane to a safe landing with a dead engine. The airplane was experimented with for the next year and many modifications made. Much of the development and test work on this prototype was done by Mr. A. G. Pickering, who is still with the Supermarine works. (Mr. Summers, who made the first flight, is now Chief Test Pilot for the entire Vickers Group of aircraft companies.)

This first machine was fitted with a two bladed, fixed pitch, wooden propeller, in spite of which the plane was officially credited with a top speed of 355 mph! (This at a time when our best fighters, the Seversky P-35 and the Curtiss P-36 were capable of slightly less than 300 mph!)

The Rolls-Royce engine became known as the "Merlin," the aircraft was officially accepted into the Royal Air Force as the "Spitfire" and a "new" fighter was born. But its gestation period was nearly 15 years of day-and-night work for Mr. Mitchell, et al.

Our Plane on the Cover, this month, is the very latest version of the Spitfire known as the Mark IX, or Model 9. It is the culmination of twenty years research in high speed design and this latest version further widens the Spitfires' lead over the rest of the world's fighters.

The wing of the Spitfire approaches the aerodynamically "perfect" elliptical planform which is highly efficient but comparatively difficult and costly to build. It is the single-par type, the spar being located nearly 33% of the chord aft of the leading edge. The spar is made up of tubular caps riveted to a plat plate web suitably stiffened. The wing leading edge is formed of heavy gauge sheet riveted to the spar to form a strong, torque-box structure. Aft of the spar the wing is built up of chordwise ribs covered by light sheet. Aluminum alloy flush riveting is used throughout. Ailerons are metal frame, fabric covered. Three split trailing edge-type wing flap panels are located one in each wing panel between the ailerons and the fuselage and a large panel beneath the fuselage. Wing tips are of formed sheet and are detachable.

The fuselage is all-metal monocoque design, composed of three sections, the forward section being a welded steel tubing engine mount and the aft section mounting the tail units.

The main portion of the fuselage is built up on a framework of four main longerons, transverse frames, longitudinal stringers and flush riveted skin.

The landing gear is composed of two main single-trut oleo members and a fixed tail wheel strut. The main gears fold outward into recesses provided in the wing panel by hydraulic action. The underside of the gear is covered by a fixed fairing attached to the gear which seals the opening upon retraction, with the exception of a small portion of the tire.

Power is provided by the new Rolls-Royce Merlin 61 which develops in the neighborhood of 1,600 hp. at 18,000 ft. This engine is the first British design equipped with a two-stage two-speed supercharger which does not increase the maximum power available of the engine but raises considerably the engine's "critical" altitude (that altitude at which sea-level power of the engine begins to drop off). This supercharger consists of an arrangement radically different from the well-known American version and is of considerable interest. In the American design (P&W Twin Wasp R-2800 engine), air is taken into a gear-driven auxiliary blower which has a two-speed gear clutch giving a "low" and "high" speed similar to an automobile. This compressed air is then taken through an intercooler which is air-cooled, thence through the carburetor where it is mixed with fuel vapor, thence into the main stage blower, which has a constant gear ratio and acts primarily as a diffuser, and finally into the engine. This is not the case with the Merlin 61 which takes the air directly into the up-draft carburetor first and thence into the first stage of supercharging. The resulting vapor is pressurized (leading, one would think, to a condensation of the fuel out of the vapor form, though evidently not the case) and is thence routed directly into the second stage of supercharging which is equipped with two-speed gearing clutch. This vapor, pressurized and heated, is then routed through the intercooler which is water-cooled and thence into the intake manifold. This arrangement appears illogical to most American designers and even unworkable to some, but obviously the system works and works well.

The engine cobling system consists of an ethylene-glycol fluid reservoir or "header tank" located immediately aft of the propeller spinner over the engine gear-box, two cooling radiators located one under each wing, pumps, lines and fittings. This fluid, with its high boiling point, is forced through the cooling jackets around the cylinder banks from which it extracts heat which it carries down to the radiators and passes on to the air. The rate of passage of this heat to the air (in cold air such as at altitude it is desired to keep the engine warm) is controlled by the rate of air flow through the radiators, which is controlled by doors mounted on the aft side of the radiator at the outlet.

The oil system consists of a reservoir located beneath the engine just aft of the propeller, its surface actually forming the surface of the lower engine cowl, thereby aiding in oil cooling. The oil radiators are located adjacent to the cooling fluid radiators within the same fairing on the earlier models but in a separate enclosure on the Mark IX.

The fuel system consists of two large tanks located aft of the firewall just forward of the pilot, an upper tank and a lower tank each extending the full width of the fuselage. Due to the location of the carburetor on the extreme lower rear portion of the engine and the tanks immediately aft

of the carburetor, the fuel system consists only of a single short line from the selector valve to the carburetor, highly invulnerable compared to most other designs where the fuel must be carried from wing tanks inboard to the engine compartment and thence up to the carburetor. The oil tank has a capacity of 8 gallons and the fuel capacity is 110 gallons.

The pilot is located aft of the tanks in a notoriously cramped cockpit, a penalty which must be paid for slimness ratio in a fuselage. His head is exposed in a tiny sliding hatch and windshield assembly which is the only really bad but unavoidable feature of the Spitfire. Landing approaches are normally blind for the pilot even with the hatch open (which is normally the case), and this feature, coupled with the comparatively high landing speed of the Spitfire (80-85 miles per hour with full flaps) makes it no ship for the amateur to handle and certainly not an airplane for even an experienced pilot to "play" with while on or near the ground.

Battery and parachute flare cans are located aft of the pilot and radio transmitter and receiver are located on a shelf behind his head. An antenna mast is mounted above the radio equipment aft of the rearmost position of the cockpit hatch in its aft position making for a short antenna lead-in wire, another good feature. The antenna stretches from the mast to the top of the rudder.

The propeller is a big, four-bladed constant-speed DeHavilland hydromatic design built from Hamilton-Standard (U.S.) designs under license.

The Spitfire Mk. IX has a wingspan of 36 ft. 10 in. and an over-all length of 31 ft. 5 in. It has a wing area of 242 sq. ft. and a height (thrust-line level) of 11 ft. 9 in. Empty weight is 5,010 lbs. and gross (full military load) weight is 6,340 lbs. This gives it a wing loading of 26.2 pounds per square foot, which is the whole secret of the Spitfire's success, comparable American and enemy fighters having wing loadings of 35-50 lbs. sq. ft. It has a power loading of 3.96 pounds/brake horsepower, accounting for its high rate of climb which is 3,100 feet per minute.

British fighter armament has consisted of seemingly endless combinations of .303 caliber machine-guns and 20 mm. shell-guns, and the Spitfire has had its full share of modifications during its nine models. The Mark IX carries provisions for four 20 mm. cannon and four .303 caliber machine-guns divided into each wing panel. At the present writing, only two of the four 20 mm. cannon are being carried in the Mark IX. This may seem odd but may be accounted for, for two reasons: the complete 20 mm. cannon installation weighs in the neighborhood of 180-200 pounds without ammunition, and the present opposition being met by the Spitfire is being very capably taken care of by present armament arrangement. At a moment's notice, however, two additional cannon may be installed as provisions, even to the leading edge trunnions and covers, are carried as a permanent installation. These guns carry explosive or ball ammunition which must be power-fed to the gun, the shells and links being far too heavy for the mechanism of the gun to pull alone, as on the .30 and .50 American machine-guns. This feed, invented by the Frenchman, Chatterault, consists of a spring actuation star wheel which is given its initial tension on the ground during loading operations and in the air each action of the gun bolt winds the spring a notch, thereby preserving its tension. The shells are carried in a cylindrical 60-round drum which is too big to install completely within the thin wing of the Spitfire and therefore requires large streamlined housings.

Most assuredly the Spitfire Mk. IX is capable of 400 miles per hour, as has been quoted for the Spitfire since the Mk. V, but just how much more must remain a secret. This is also true of the service ceiling of 36,000 feet quoted for the early models. As stated previously a Mark IX succeeded in downing a German Junkers photographic version of the deadly dive bomber over Tunisia at an altitude of 50,000 ft., which can most assuredly attest to the design's high-flying qualities.

We thus see quite clearly that behind the latest, breath-taking innovations in fighter or bomber design frequently lies the heart-breaking story of sleepless nights, trials and failures and eventual success bought at a cost of time, patience and incessant devotion to the task. This spirit, as long as it pervades the industry, will make possible the continuous improvement of the breed which, at present, is embodied in its epitome: the Super Spitfire!

VICTORY

de luxe
GIANT
Solids
CHOICE OF 16 MODERN FIGHTERS BOMBERS
WINGSPAN TO 22½"
Any Model Speedily Converts Into
MOVABLE CONTROL TYPES!
FULL SIZE 3-VIEW PLANS IN KITS
Available in popular "DE LUXE" or "STANDARD" kits convert either type into MOVABLE CONTROL model by hinging rudder and "stabs" at hinge lines!
CURTISS P-40
Wingspan 20
NORTH AMERICAN
Wingspan 20½"
SPITFIRE
Wingspan 18½"
BREWSTER-BERMUDA
Wingspan 17"
"Lifetime" MODELS WITH FULLY CARVED FUSELAGE
Saves 4 to 6 hours carving! SANDING ONLY NEEDED!
Each kit contains cut-to-outline shape fuselage, wings (tapered trailing and leading edges where necessary!) nacelles, stabs and rudder; Material to make propeller, wheel pants where required. Turned wheels, Insignia, Cement, Base Paint, Celluloid for cockpit enclosure. Aluminum cowls where specified on plans. DELUXE KITS contain FULLY CARVED-TO-SHAPE FUSELAGE in place of cut-to-outline fuselage. Kits are identical in all other respects!
$2.50 Most Types
These are super-detailed in every respect! In most cases (where governmental regulations did not conflict!) the models and working plans were scaled down from ORIGINAL PLANS! DE LUXE or STANDARD makes up a beautiful, faithful replica of the original!
STANDARD KITS with cut-to-outline fuselage are $1.50 for most models.
BY MAIL: add 20c per kit to cover packing, postage! (NO C.O.D.s).
BAY RIDGE GAS MODELS
National "C" Champ
PACER
Winner last Nationals "C" event with total time 24 mins., 42 sec. Built in adjustments. Sharp right turn under power, slow left circle in glide. 60" span, 45" length $4.95 PACER "B" 53" span, 37½" length.
$3.95
STRATO-SPEAR. Jackson's "A" "B" Gas flier. Planked fuselage, formed landing gear, cut firewall, removable pylon. $2.95.
MIKE "A" 48". First small ship in gas model history (originally $4.95) $1.49.
DIAMOND DEMON 44" span $1.49. TOPPER "A" Skyscraper wings. $3.50.
BANTAM Replacement Parts
Exclusive, authorized distributor for available parts. Write your needs.
ACCESSORY KITS $1.00
Foil paper, brush, cement, insignias, colors, sandpaper and stylus for rivet detail incl. instructions.
36 pg. ILLUSTRATED CATALOG
36 pg. illustrated booklet, 5c. (Free with each kit) NOTE: Mail orders must include postage for delivery! NO C.O.D.
CONSOLIDATED Model Eng. Co.
Dept. MA-6 3079 Third Ave. New York, N. Y.

Air Ways

(Continued from page 35)

hope that these suggestions will be taken in the proper vein since we very obviously have nothing to gain by having them adopted."

Canada

Charles Fox of 793 Argyle Road, Walkerville, Ont., Can., President of the Windsor Model Aircraft Club, writes:

"Despite gas rationing, etc. etc., the Windsor Model Aircraft Club will hold its fifth annual international model plane contest in July this year.

"In order to save wear and tear on the timers and officials we have decided to hold several of the events on Sunday, July 4th, and the remainder one week later on July 11th.

"The events to be held on July 4th are as follows:

Any class tow line glider....Entry fee $ .15

Any class rubber-powered model ..... " " .15

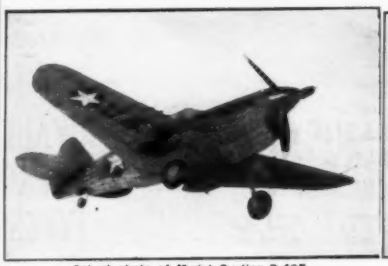
Junior event rubber-powered models built by contestants 14 years and under ..... " " .10

"The events to be held on July 11th are:

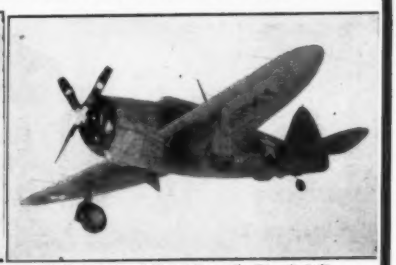
Complete Realism and Detail

THESE TWO C-Z FIGHTERS

A NEW TECHNIQUE .... MORE FUN .... NEW MATERIAL



Actual photo of Model Curtiss P-40F



Actual photo of Model Republic Thunderbolt

Pictured here are just two of the new series of scale jobs designed by C-Z. This new material and startling realism has caused a sensation in scale model building circles . . . all the detail to satisfy the most critical along these lines and due to C-Z's expert designing these jobs are simpler than ever to construct . . . all hollow construction, ribs, formers, etc., and yet a tougher finished job than solid balsa. No paint is necessary because the authentic color is right on the new material and all parts are clearly printed for quick and accurate assembly. Each detail is numbered and full size plans make it easy to follow and fun to complete. Your dealer should have the new series in stock right now. Watch the list grow. If by chance he is not yet supplied send direct to us and send 15c for postage and packing.

STILL AVAILABLE. Many of these C-Z dealers still have on hand the original C-Z metal covered scale model kits. If you are lucky and if you hurry you can still build one of these famous kits . . . the last you will get for the duration.

2 Navy Planes	Grumman Avenger	85c
	Curtiss Hell Diver	75c
2 Army Planes	Curtiss P-40-F	50c
	Republic Thunderbolt	50c

C-Z Model Airplane Co. Dept. M, 5056 Archer Ave. CHICAGO, ILLINOIS

Class A gas	Entry fee	$	.25
Class B gas	"	"	.25
Class C gas	"	"	.25

"Prizes will be model supplies and other useful merchandise.

"We are waiting to see what the 1943 A.M.A. rules are like before deciding what rules will govern the meet."

Washington

Lester Ritchie, formerly of the Dope Daubers club of Concord, N.C., and now stationed at the Portland Air Base, Oreg., writes us that his club is entirely broken up due to the war; all the boys, like other modelers, are serving in the armed forces and there are only a few left. Homer Bailinyer of 2413 Kannaplis Rd. and Kenneth Nieler of 353 Vance St., Concord, N.C., are two of these. They would like to contact nearby modelers and secure suggestions on enrolling new club members. Perhaps there will be a number of new builders in the vicinity who would like to join a club. Here is their chance!

Notice

Alicia M. Hills of Labor-In-Vain Road, Ipswich, Mass., who is 12 years old, would like to correspond with someone genuinely interested in the model hobby and who believes America's future is "in the Air." Miss Hills makes her own models and does very well indeed, even though she is not as old as many of the experts.

VICTORY

Flash News

(Continued from page 2)

pick up the wounded. "Considerable experimenting is now in progress towards using helicopters as front line ambulances," he says, "if the lifting load can be built up—and the engineers say it can." The value of this successful type of aircraft, proved by Igor Sikorsky, cannot be over-estimated, as it could drop down on shell-pock-marked areas and pick up the wounded where other planes or even ground ambulances could not go.

The famed Lockheed P-38 has now become a two-seater! Well, not actually, but numbers of them are now being modified to permit a second crew member to ride aft of the pilot on the radio shelf. The passenger must ride in a crouched position but the Army has stated that other types of single-seater fighters will be so modified. Purpose of the move is to permit students to go aloft with an instructor in high powered super-fast pursuit ships and watch and listen to the instructor as he puts the ship through its paces. The problem of acclimation for advanced pilots before giving them combat airplane experience has been a great one insofar as the Airacobra, the Warhawk or the Lightning accommodates only the pilot. It has therefore been necessary for an advanced pilot to climb out of a North American AT-6 or Vultee BT-13 into a 400 mph Mustang and fly it for the first time, frequently not too successfully! It is now possible for the student to go aloft for an hour's instruction (dual—mind you) in the super-hot fighters before taking the controls himself for the first time. According to Jimmy Mattern, crack Lockheed test pilot who has been demonstrating the two-seater at a series of Army bases, the accident rate has been cut down from an index of 6.5 to only 1.5 within two months of the plan's introduction.

Henry J. Kaiser has purchased a couple of aircraft factories as a side-line during one of his sweeps around the country inspecting the various plants of his vast industrial empire. As has been remarked: "The Kaiser is on the Allied side in *this* war!" He has purchased controlling interest in Fleetwings, Inc. and Brewster Aeronautical Corporation. Fleetwings is noted for its research and successful development of spot-welded stainless steel for fabrication of aircraft sub-assemblies and once built an entire airplane (an amphibian) out of the material. Brewster is designer and builder of such planes as the Buffalo (MODEL AIRPLANE NEWS, May 1941 issue), known in the Navy as the F2A-1, and the Bermuda known in the Navy as the SB2A-1.

Jacqueline Cochran Odlum, renowned woman racing flier who holds all the major women's flying records, is now operating the Army's woman pilot training schools at Sweetwater and Houston, Texas. Graduates of her schools undertake ferry and other noncombat flying within the continental limits of the United States.

According to Maj. Gen. Harold L. George, the U. S. Army Air Transport Command "now girdles the globe and is larger than the world's combined commercial airlines before the war."

Brig. Gen. Howard K. Ramey, commander of the 5th Bomber Command, has failed to return from a recent mission, according to General Douglas MacArthur. Ramey, one of the outstanding heavy bombardment officers of the U. S. Army Air Forces, succeeded Brig. Gen. Kenneth M. Walker to the command, who was lost on a bombing mission over Rabaul, New Britain, last January.

Major Algene E. Key has received the Distinguished Service Cross for taking part in enemy action during which his bomber was badly damaged. His Fortress was attacked by two Focke-Wulf fighters (MODEL AIRPLANE NEWS, November 1942 issue) head-on, one of them hitting the rear of his ship with a cannon shell. With a gunner wounded and his ship almost unmanageable, Major Key continued on towards Romilly-sur-Seine and dropped his bombs as prescheduled. He then led his squadron back to England. Major Key is none other than Al Key, who with his brother, Fred, now a Captain in the Army Air Forces, set an endurance record of 653 hours and 34 minutes in 1935!

Alexander Kartveli, vice-president and chief engineer of Republic Aviation Corporation has received the honorary degree of Doctor of Science from Temple University

32 OFFICIAL PHOTOGRAPHS U.S. ARMY & NAVY PLANES $1.

Dive and Torpedo Bombers.
★ Light and Heavy Bombers.
★ Fighters ★ Trainers.
★ Paratroop and Troop Transports, etc.

Guaranteed authentic reproductions of official U. S. Army and Navy photographs, showing planes in flight. Each photo, 8¼ x 5¼ is suitable for framing. Perfect to send to men in the service. Only $1.00 postpaid.
ABBOTT CO., P.O. Box 63-D, Macon, Ga.

WHERE TO BUY IT

Hobby Dealers: Use this Classified Directory to reach *active* hobbyists in your vicinity. Write now for special low rates. Forms for July issue close May 10.

HOLLYWOOD, CALIFORNIA

DOUG DOUGLASS
1728 N. Highland Ave. Gladstone 7285
HOBBY SUPPLIES
Models—Planes—Boats—Trains and Equipment
CASH PRIZES! CASH PRIZES!
Enter Doug Douglass' Contest. See rules in THE MODEL RAILROADER for May

LOS ANGELES, CALIFORNIA

PICO MODEL AIRPLANE CO.
2580 W. Pico Blvd., Los Angeles, Cal.
We carry all nationally advertised Planes, Motors, HO Trains, Boats,
Phone Drexel 5894
Prompt mail order service.
Open 9 A.M. to 9 P.M.

PASADENA, CALIFORNIA

ACE MODEL SHOP
Hobby Headquarters
Complete Line of Model Supplies.
TRAINS • PLANES • BOATS • RACE CARS
Open evenings 'til 9. Phone Sy 3-6061
808 E. Colorado St., Pasadena, Calif.

HARTFORD, CONNECTICUT

Be-Prepared For Good Flying Weather
Save your $$$ and ¢¢¢ buy our picked line of swell flying ships the price range you will recognize as outstanding value for your money. Even under present conditions we will endeavor to supply you the best obtainable kits and accessories on the market and keep you (FLYING) ••• We have many customers who would like to have your old motor that perhaps is now in the attic, why let it stay there, contact us with full particulars as to the type, condition and your lowest price for quick sale.
MODEL BUILDERS GUILD
Established 1933
EIGHTY-ONE LAWRENCE ST. HARTFORD, CONN.
Open 10 A.M. to 6 P.M. Phone 6-2475

SACRAMENTO, CALIFORNIA

"HOBBYCRAFTS"
PLANES—TRAINS—BOATS
MODELMAKERS' KITS AND SUPPLIES OF ALL KINDS
CASH PAID FOR NEW OR USED ENGINES
Open Evenings
1316 Del Paso Blvd., No. Sacramento
Phone 9-3939

WASHINGTON, D. C.

Since 1890
CORR'S
Complete Stock Airplanes - Boats - Trains - Race Cars -
Full line of motor parts
Mail orders filled immediately
812 9th St. N.W., Dept. A, Wash., D.C.

CHICAGO, ILLINOIS

PAT SWEENEY'S HOBBY SHOP
VISIT THE MOST COMPLETE HOBBY SHOP IN CHICAGO
Race Cars—Boats—Engines
Surface Line, Bus and Elevated to the door.
4508 Broadway Chicago
OPEN TUES., THURS., SAT. EVE., 9 P.M.
Phone Long Beach 7251

CHICAGO, ILLINOIS

WEST TOWNS HOBBY SHOP
5729-31 W. Lake St.
Opposite Menard St. "L" Station
Leading lines of model airplanes, boats and railroads in stock.
Phone Estebrook 3272.
No parking troubles.

DETROIT, MICHIGAN

THE MODEL SHOP
1474 Gratiot Ave., Detroit, Mich.
We stock Comet, Ideal, Marine Model, Capitol, Megow, Berkeley and all major lines.
The Model Shop for Model Builders!
Ph. Ra. 9113

GRAND RAPIDS, MICHIGAN

MOORE'S HOBBY SHOP
16 W. Fulton—Phone 89077
Western Michigan's Oldest and Largest Hobby Shop.
Trains—Planes—Boats
Send your order by mail.

ST. LOUIS, MISSOURI

HOBBY-CRAFT
Compton At Shenandoah, St. Louis, Mo.
Read the Ads in Model Airplane News Then
Write—Wire—Call Your Order.
We Got It.
3 Hour Mail Order Service.
Send In Your Old Motor For Estimate

NEW BRUNSWICK, NEW JERSEY

STEVE VARGA'S HOBBY SHOP
We Carry All Leading Lines of Model Airplanes—Ship Models and Model Railroad Supplies in H. O. Gauge
Mail Orders Promptly Filled
55 Easton Ave., New Brunswick, N. J.
Telephone N. B. 7616

NEW YORK CITY, NEW YORK

In New York it's POLK'S. Kits, Engines, Railroad Equipment, Boats, Race Cars and Supplies for All Hobbies. Come in and see us.
Phone Longacre 5-2434
POLK'S MODEL CRAFT HOBBIES
429 7th Ave. New York City

NEW YORK CITY, NEW YORK

GAS & RUBBER MODEL ACCESSORIES
Beginners or advanced modelers equally welcomed. Advice cheerfully given.
Gas Motors—Gas Jobs
Mail orders promptly filled. Minimum $1.00
YORKVILLE MODEL AEROPLANE SUPPLY CO.
208 East 88th Street, N. Y. C.

ROCHESTER, NEW YORK

CRAFT SERVICE
"Complete Hobby Stocks"
C-D, Comet, Peerless, Berkeley, Capitol, Strombeck, Ideal, Megow, American Junior . . . all major lines, complete.
"Send in your used motor for cash appraisal"
Courteous fast replies—24 hour shipments. Write to our "Hobbyland Shop."
Also supplies for Leathercraft, Archery, Beadcraft, Plastics, etc.
337 University Avenue Rochester, New York

YONKERS, NEW YORK

WESTCHESTER COUNTY'S HOBBY HEADQUARTERS
Model Airplanes (Gas & Rubber), Boats and HO Railroad Kits & Supplies.
THE FIRESIDE SHOP, INC.
233 Nepperhan Avenue, Yonkers, N. Y.
Open Monday, Friday, Saturday evenings until 9.

PORTLAND, OREGON

PORTLAND HOBBIES AND HOME FURNISHINGS CO.
Railroads, O-HO-OO, scale Model Boats. Aeroplanes, solid and flying models, Leading lines, Cleveland, Hawk, Berkeley, Model Craft, Scientific and others. Ritz, Airflow and D.G. Propellors. Sting Ray new control line model for class "B" or "C" motors.
5100 S.E. Foster Road Open until 9 P.M.
Portland, Ore.

SEATTLE, WASHINGTON

HOBBY CRAFT—H. T. WEEKS
THE BON MARCHE DEPT. STORE
SEATTLE, WASH.
We carry all the leading lines of Model Airplanes, Ship Models, Model Railroads O-OO-HO, and Autos.
Large stock of parts and supplies
Mail orders filled same day received

MILWAUKEE, WISCONSIN

STEVE PATTI COMPANY
Nationally Advertised
Lines of Models and Supplies
ARCHERY EQUIPMENT
Prompt Mail Order Service
Send for catalog, 10c
1443 W. Forest Home Avenue
Milwaukee, Wisconsin

TORONTO, ONT., CANADA

Visit Canada's Most Complete Hobby Stores.
Railroads. O-HO-OO-Tinplate.
AIRPLANES—BOATS—RACING CARS—MOTORS.
COMET — IDEAL — BERKELEY — CLEVELAND — EASYBUILT and other popular makes.
Open Evenings. Wholesale and Retail.
Complete Catalog 10 cents.
LLOYDS HOBBYCRAFT
635 St. Clair Ave. W.

WINNIPEG, CANADA

ST. JOHN MODEL SHOP
The West's Leading Hobby House
Complete stock of all the popular makes including COMET—BERKELEY—MEGOW—SCIENTIFIC and EASYBUILT kits.
Dept. A
644 Portage Ave. Winnipeg, Man.

CLASSIFIED DIRECTORY

Advertise in this directory for quick profitable results! Rates 10c per word including name and address. Minimum 20 words. REMITTANCES MUST ACCOMPANY ALL ADS FOR THIS DIRECTORY. Advertisements for July issue must be in by May 10.

WE PAY CASH for new or used model airplane motors or race cars. Hobbycrafts, 1316 Del Paso Blvd., Sacramento, Calif.

G.H.Q. ENGINES wanted. Send engine for highest cash offer, regardless condition. G. H. Q. Motors, 40 E. 21st St., N.Y.C.

AIRCRAFT OF America—At War! Send 25c coin for three 9" x 12" sample drawings of Lightning, Avenger, Corsair, and list of others. Henry Clark, 147-28 90th Ave., Jamaica, N.Y.

CASH FOR USED Motors, race cars. Prefer Super Cyclones, Ohlssons, Hornets. Hobby Shop, 372 N. Snelling, St. Paul, Minn.

COMET DISTRIBUTORS

Comet distributors, carrying complete stocks of Comet kits and supplies, are ready to serve dealers in every part of the country—promptly and efficiently.

Comet Western Model Airplane Co.
Pacific Coast Distributor
4546 Hollywood Blvd.
Los Angeles, California
1060 East 12th St.
Oakland, California

•

K. S. Caufield
Louisville Distributor
308-310 S. Third, Louisville, Ky.

•

H. F. AULER COMPANY
Wisconsin Distributor
1743 West Fond du Lac Ave.
Milwaukee, Wis.

•

Model Airplane Supply Co.
Houston & So. Texas Distributor
3105 S. Main St., Houston, Texas

•

HOBBY JOBBERS
New York Met. Area Distributor
Order Dept.—Office: 429-7th Ave., New York City

•

Modelcraft Distributors
Twin City Distributors
1336 S. Miss. Riv. Bl., St. Paul, Minn.

•

John Dunn, Inc.
Boston Met. Area and Maine Distributors
87 High St., Boston, Mass.

•

Germantown Model Supples
Metropolitan Philadelphia Distr.
4523 N. Broad St., Philadelphia, Pa.

•

DAYTON HOBBY SERVICE
Ohio Distributor
313 S. Main St.
Dayton, Ohio

DOUGLAS MODELS CO.
Utah Distributor
105 E. Second South St.
Salt Lake City, Utah

•

Calvin C. Wood
Colorado Distributor
375 S. Williams, Denver, Colo.

•

LLOYDS HOBBY CRAFT
Canadian Distributor
625 St. Clair Ave., West
Toronto, Ontario, Canada

•

Howard E. Ruth Models & Supply Co.
Distributor Buffalo Area
1466 Genesee Street
Buffalo, N. Y.

•

AIRCO MODEL SUPPLY
Cent. and Eastern Michigan Distr.
1485 Antietam St.
Detroit, Mich.

•

Walthour & Hood Co.
Miss., Ala., Ga. Distributor
Pryor St. & Auburn Av., Atlanta, Ga.

•

KING MODEL AIRPLANE CO.
Kansas City, Mo. Distributor
4801 Independence Ave.
Kansas City, Mo.

•

J. Spokane & Co.
Pittsburgh Area Distributor
1106 Fifth Ave., Pittsburgh, Pa.

•

HAINES HOBBY
Distributors for the Reading Area
44 S. Sixth St., Reading, Pa.

•

SCRANTON HOBBY CENTER
Scranton Area Distributor
315 Adams Ave., Town Hall Bldg.
Scranton, Pa.

in Philadelphia. Kartveli, famed as designer of the mighty P-47 Thunderbolt (MODEL AIRPLANE NEWS, December 1942 issue), and the earlier Republic P-43 Lancer high-altitude fighter (MODEL AIRPLANE NEWS, February 1940 issue). Kartveli was an artillery officer in the Imperial Russian Army in the first world war and received his engineering education in Paris following the war.

Distinctive insignia will be issued to Army Air Forces Enlisted Reserve Corps members who are awaiting a call to active duty, the War Department announces. The insignia, now being procured by the Quartermaster General of the Army, will consist of a small pair of wings with the letters "AC" on a blue disk in the center. The insignia is designed for wear on the coat lapel of civilian clothes or on a similarly conspicuous place. The insignia is expected to become available in the very near future. Young men who volunteer for service in the Army Air Forces Enlisted Reserves or apply for training as aviation cadets will be issued the insignia upon being accepted for services. Thousands of young men who are now awaiting call to active duty actually are members of the armed forces but because they are not yet on active duty they have no way of displaying their affiliation with the Army; the wearing of the new insignia will immediately catalog these young men as future members of the Army Air Forces.

The following chronological record of the action of a Boeing Flying Fortress during a successful daylight raid on the German submarine base at St. Nazaire, France, tells, cryptically, a glorious story of heroism, gallantry and "sheer guts":

"1:28 P.M.—Enemy aircraft attacked from right front and below. As he passed tail gunner fired, hitting the fighter's tail and as enemy aircraft turned he got more bullets in the nose. Heavy black smoke came out and fighter disintegrated. One wheel was seen to fly through the air and pilot to bail out.

"1:34 P.M.—Enemy aircraft came in from right rear and below. Right waist gunner fired steadily from 500 to 200 yards. At 200 yards enemy aircraft fell out of control, waist gunner claiming it hit the sea. Pilot did not bail out.

"1:35 P.M.—Enemy aircraft came in from right rear and below coming up. Ball turret gunner fired first, hitting enemy aircraft at 100 yards. At 50 yards bullets entered motor and fighter burst into flames and broke in pieces. Crew doubt pilot could have bailed out.

"1:36 P.M.—Enemy aircraft came in from right front and above. Top turret gunner fired hitting enemy aircraft at 400 yards. At 200 yards plane peeled off in smoke and flame, then broke up after tracers entered engine.

"1:38 P.M.—Enemy aircraft came in from right and above out of sun. Right waist gunner fired at 400 yards. At 300 yards enemy aircraft was hit in nose, began smoking heavily and pilot bailed out.

"1:39 P.M.—Enemy aircraft attacked right rear and below zooming up at ball gunner who fired, seeing tracers go into engine and through cockpit. The FW was seen to disintegrate and fall into the water.

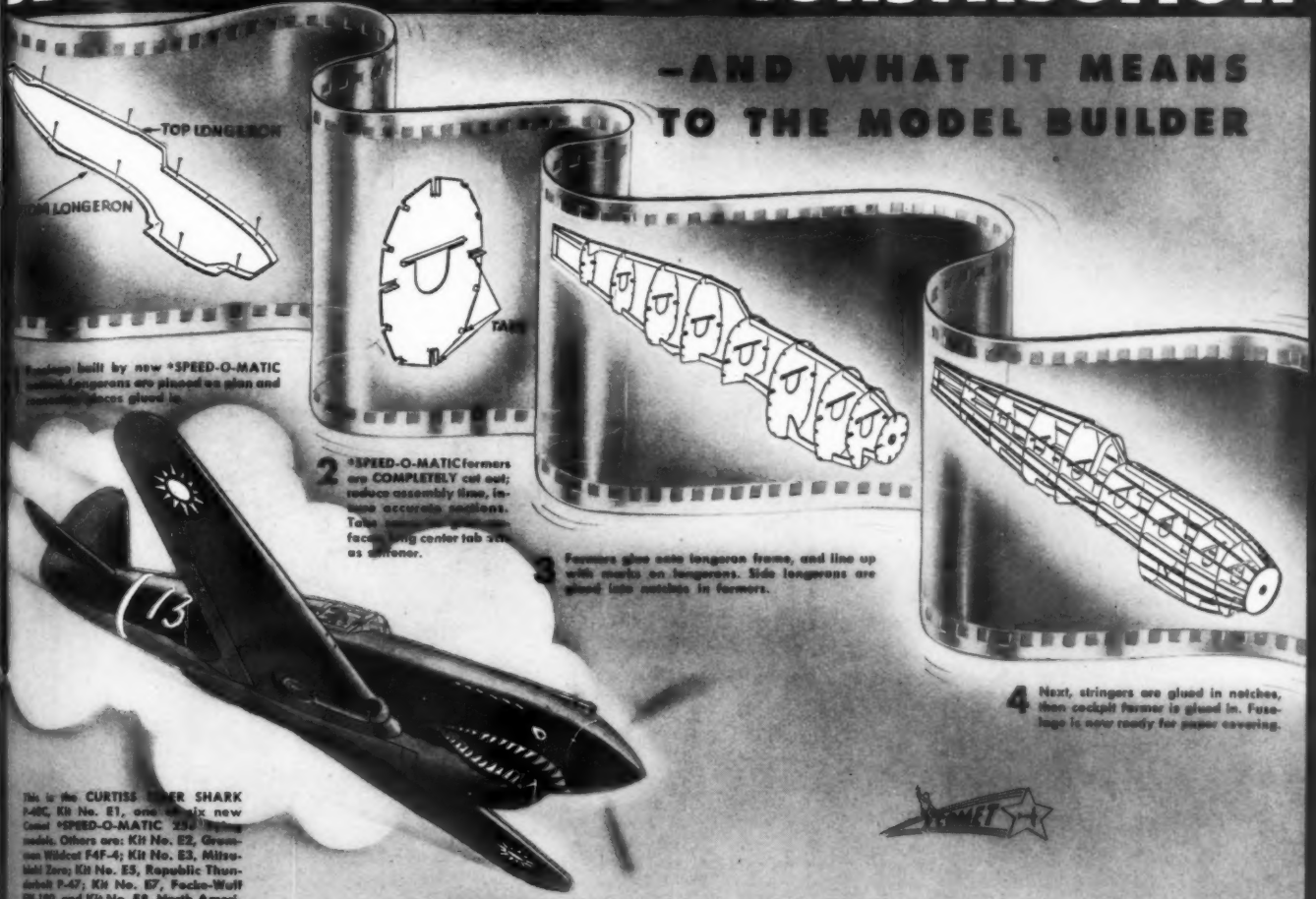
"1:40 P.M.—Enemy aircraft came in from right front and above. As it came over waist gunner fired, hitting plane as it was receding. Enemy aircraft fell out of control at about 1,000 yards and ball turret gunner saw it hit the sea."

A package only slightly smaller than a baby grand piano was hauled by a soldier recently into the desert post office operated by Sergeant James E. Conant, of Bozeman, Montana, at United States Air Forces station in the Libyan desert. The soldier calmly asked that it be mailed to his younger brother in Arkansas. Inquiry showed that it contained varied gear and fragments from a damaged German Messerschmitt. Sergeant Conant explained some of the facts of shipping space to the souvenir collector.

[PRINTED IN U.S.A.]

COMET'S *Sensational New* "SPEED-O-MATIC" CONSTRUCTION

—AND WHAT IT MEANS TO THE MODEL BUILDER



Fuselage built by new *SPEED-O-MATIC method. Longerons are pinned on plan and cross-pieces glued in.

2 *SPEED-O-MATIC formers are COMPLETELY cut out; reduce assembly time, insure accurate sections. Take [illegible] facing. Long center tab acts as stiffener.

3 Formers glue onto longeron frame, and line up with marks on longerons. Side longerons are glued into notches in formers.

4 Next, stringers are glued in notches, then cockpit former is glued in. Fuselage is now ready for paper covering.

This is the CURTISS TIGER SHARK P-40C, Kit No. E1, one of six new Comet *SPEED-O-MATIC 25¢ flying models. Others are: Kit No. E2, Grumman Wildcat F4F-4; Kit No. E3, Mitsubishi Zero; Kit No. E5, Republic Thunderbolt P-47; Kit No. E7, Focke-Wulf FW-190, and Kit No. E8, North American Mustang P-51.

-and wait 'til you see the new-type PLANS!

The pictures above are intended to show you just how quickly and easily you can construct the fuselage of a flying model by the Comet *SPEED-O-MATIC method—and the wings, tail and stabilizer are just as easy! This is due in part to the unique new plans furnished with each *SPEED-O-MATIC kit—plans which are amazingly detailed, and just packed with new ideas and short-cut construction methods. Plans also contain interesting facts about the actual planes, details of a new method of flying these models without the use of rubber, and a series of "Plane-Facts" which are really a short course in aeronautics.

Right now, your dealer has the first series of Comet *SPEED-O-MATIC models on his shelves—*and there are more coming, in every price range.* Look for them—buy them—build them—and let *SPEED-O-MATIC give you your biggest model-building thrill!

*Patent Applied For—Trade Mark Reg. U. S. Pat. Off.

CHECK THE FEATURES!

1 **FINISHED PARTS**—Formers completely cut out; finished wheels, thrust button, turned cowling, insignia.

2 **CUTS BUILDING TIME**—Kits practically build themselves. You save hours—get better results!

3 **AUTHENTIC, ACCURATE MODELS OF WARPLANES**—The planes that are in the news, planes every model builder wants!

4 **BETTER FLYABILITY**—Tested design, great inherent stability means these models will FLY.

5 **SCALE 3- and 4-BLADE PROPS**—New method permits construction of scale 3- and 4-bladed props.

COMET MODEL AIRPLANE & SUPPLY CO.
CHICAGO NEW YORK

Because It Carries Its Own Tools!

Today many a damaged warplane gets back to its base because it is equipped with the necessary tools to make repairs either in the air or on the ground in the event of a forced landing. Our job, among others, at Ohlsson & Rice is the production of thousands of small tools for use in the planes themselves, as well as at their bases.

To gas model builders, the name "Ohlsson & Rice" is synonymous with model engines built for all three classes of competition—A, B, and C. *Ohlsson* motors were known for their power and dependability. And they will be again. But for the present our facilities, greatly expanded, are producing tools for Victory —tools and precision parts designed to bring them back safe—and soon. *Model builders: Illustrated folder on Ohlsson motors available on request.*

OHLSSON AND RICE
MANUFACTURING COMPANY
P. O. BOX 2324 TERMINAL ANNEX • LOS ANGELES, CALIFORNIA

RIGHT OR not at all!

PISTONS KENTUCKY AV. DETROIT, MICH. 5344

BUSINESS DEPARTMENT
BROOKLYN PUBLIC LIBRARY
AV.